EnGenius

Business Solutions

User Manual

ENH220EXT
version 1.0

Long Range 2.4GHz Wireless N300 Outdoor Access Point

IMPORTANT

To install this Access Point please refer to the
Quick Installation Guide included in the product packaging.

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Chapter 1

Product Overview

Introduction

Key Features

- Up to 27 dBm transmit power enabling long range connectivity
- Support IEEE 802.11 b/g/n wireless standards with up to 300Mbps data rate.
- Two detachable 5dBi 2.4GHz Omni-directional antennas.
- Can be used with included power adapter or via PoE with PoE 802.3at - capable switches or injectors
- Secured Guest Network option available

Introduction

The ENH220EXT is a high-powered, long-range 2x2 Wireless 802.11 b/g/n Outdoor Access Point with speeds up to 300Mbps on its high-powered 2.4 GHz radios. It can be configured as an: Access Point, Client Bridge or WDS (AP, Station & Bridge). The ENH220EXT is designed to operate in a variety of outdoor environments. Its high-powered, long-range characteristics make it a cost effective alternative to ordinary Access Points that don't have the range and reach to connect to a growing number of wireless users who wish to connect to a business network. The ENH220EXT is easy to install in virtually any location with its included PoE (Power over Ethernet) injector for quick outdoor installation. The ENH220EXT enables network administrators to control its transmit power and features settings for selecting narrow bandwidth and traffic shaping. The ENH220EXT also supports wireless encryption including Wi-Fi Protected Access (WPA-PSK/ WPA2-PSK) Encryption and IEEE 802.1X with RADIUS.)

Maximum data rates are based on IEEE 802.11 standards. Actual throughput and range may vary depending on many factors including environmental conditions, distance between devices, radio interference in the operating environment, and mix of devices in the network. Features and specifications subject to change without notice. Trademarks and registered trademarks are the property of their respective owners. For United States of America: Copyright © 2014 EnGenius Technologies, Inc. All rights reserved.

System Requirements

The following are the Minimum System Requirements in order to configure the device.

- Computer with an Ethernet interface or wireless network capability
- Windows OS (XP, Vista, 7, 8), Mac OS, or Linux-based operating systems
- Web-Browsing Application (i.e.: Internet Explorer, Firefox, Safari, or another similar browser application)

Package Contents

The ENH220EXT package contains the following items:*

- ENH220EXT Access Point
- 2 detachable 5 dBi 2.4 GHz Omni-directional Antennas
- Power Adapter
- PoE Injector (EPE-48GR)
- Grounding Cable
- Pole Mount Bracket
- Wall Mount Base
- Mounting Screw Set
- Quick Installation Guide

*(all items must be in package to issue a refund):

Technical Specifications

Standard:
IEEE802.11b/g/n on 2.4 GHz
IEEE802.3at

Antenna
2 x detachable 5dBi 2.4GHz Omni-directional Antennas

Physical Interface
2 x 10/100/1000 Gigabit Ethernet Port with PoE support
LAN1 Port supports IEEE802.3at PoE Input

LED Indicator
Power
LAN 1
LAN 2
2.4 GHz

Power Requirements
External Power Adapter, DC IN, 48V/0.5A
IEEE802.3at support

Operation Modes
Access Point
Client Bridge
WDS

WDS Detail
WDS AP
WDS Bridge
WDS Station

Optimal Performance
Distance Control (Ack Timeout)
Multicast Supported
Band Steering
Fast Roaming
Auto Channel Selection
BSSID Support

Easily Management
VLAN Tag / VLAN Pass-through
Guest Network
QoS: Complaint with IEEE 802.11e /WMM
RADIUS Accounting
Wireless STA (Client) connection list
Traffic Shaping (Per SSID, Per user)

Intuitive Tools
SNMP v1/v2c/v3 support
MIB I/II, Private MIB
Save Configuration as Default
CLI Support
WiFi-Scheduler/Auto Reboot
E-mail Alert

Reinforcement Security
WEP Encryption-64/128/152 bit
WPA/WPA2 Enterprise (WPA-EAP using TKIP or AES)
Hide SSID in beacons
MAC address filtering up to 32 MACs per SSID

Https Support
SSH

QoS (Quality of Service)
Complaint with IEEE 802.11e standard

Physical/Environment Conditions
Operating:
- Temperature: -4 °F to 158 °F (-20 °C to 70 °C)
- Humidity (non-condensing): 90% or less

Storage:
- Temperature: -22 °F to 176 °F (-30 °C to 80 °C)
- Humidity (non-condensing): 90% or less

Physical Interface

Dimensions and Weights
Length: 280.48mm (11.22")
Width: 217.65mm (8.58")
Depth: 55.50mm (2.1")
Weight: 1.88Kg (4.17 lbs)

1 **2.4 GHz Antennas:** Detachable 5 dBi 2.4 GHz Omni-directional
2 **LAN Port 1 (802.3at PoE Input)**: Ethernet port for RJ-45 cable.
3 **LAN Port 2 :** Ethernet port for RJ-45 cable.

Chapter 2

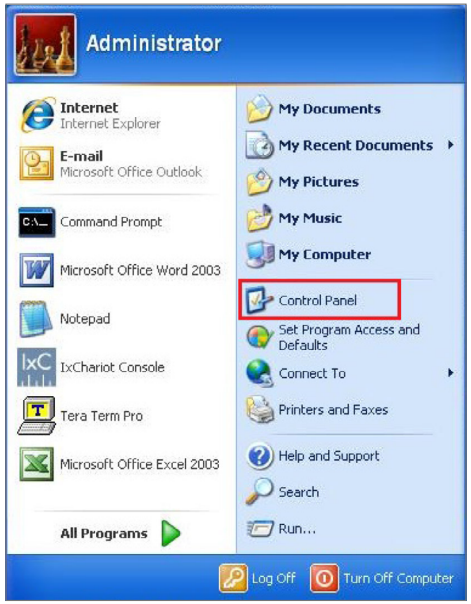
Before You Begin

Computer Settings

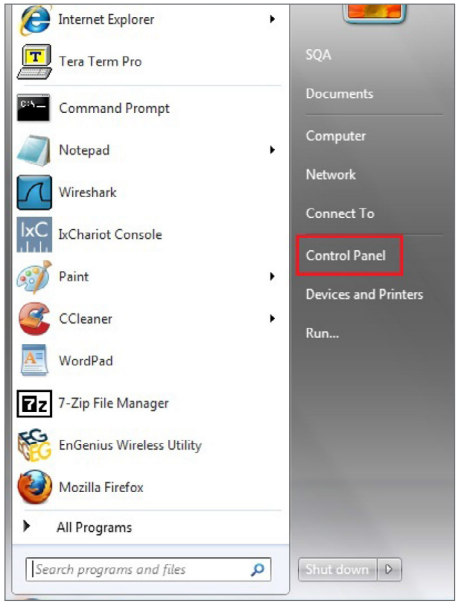
Windows XP/Windows 7/Windows 8

In order to use the ENH220EXT, you must first configure the TCP/IPv4 connection of your Windows OS computer system.

1a. Click the **Start** button and open the **Control Panel**.

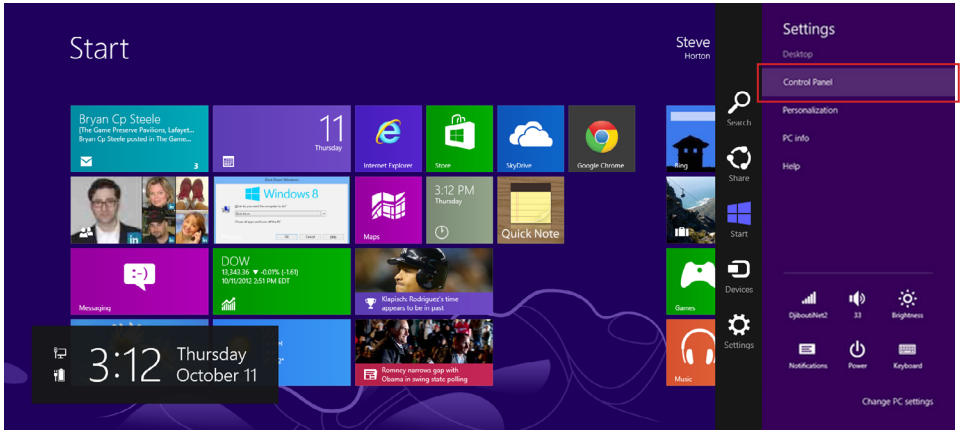


Windows XP



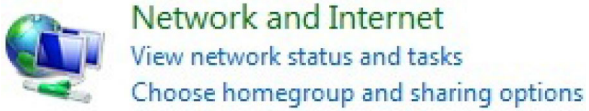
Windows 7

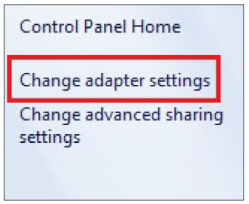
1b. Move your mouse to the lower right hot corner to display the Charms Bar and select the **Control Panel** in Windows 8 OS.



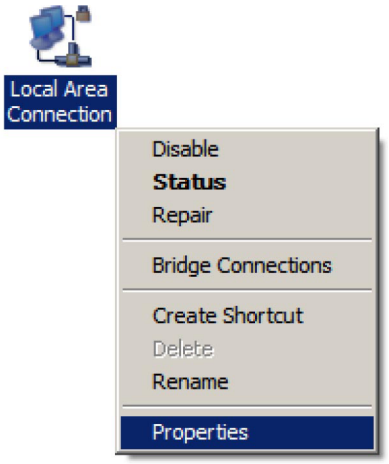
2a. In **Windows XP,** click **Network Connections.**

2b. In **Windows 7/Windows 8**, click **View Network Status and Tasks** in the **Network and Internet** section, then select **Change adapter settings.**

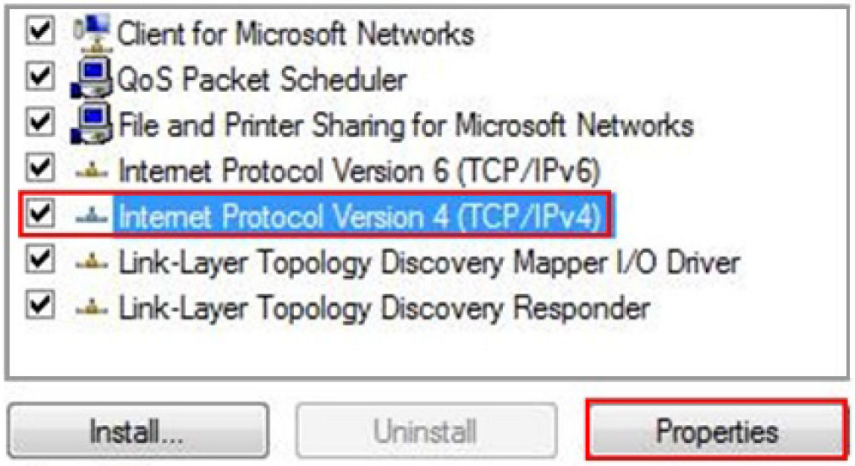




3. Right click on **Local Area Connection** and select **Properties.**



4. Select **Internet Protocol Version 4 (TCP/IPv4)** and then select **Properties**.



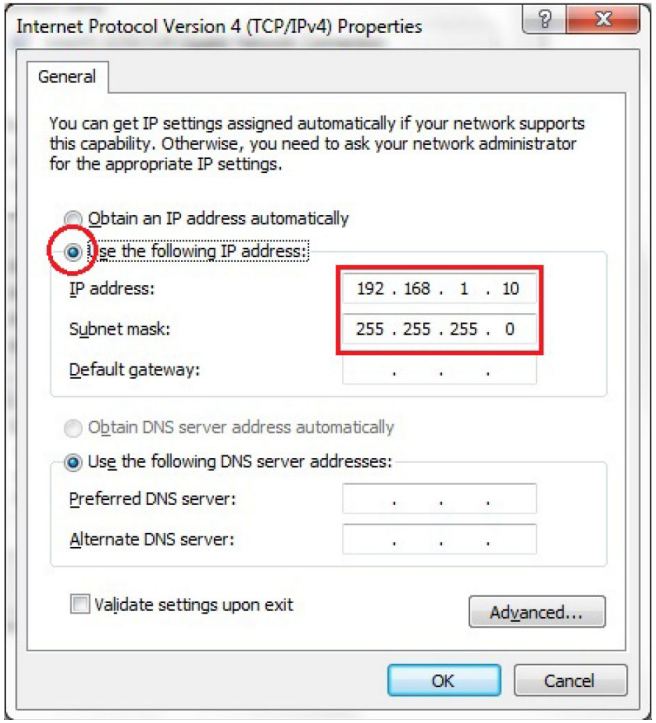
5. Select **Use the following IP address** and enter an IP address that is different from the ENH220EXTand Subnet mask, then click **OK**.

Note: Ensure that the IP address and Subnet mask are on the same subnet as the device.

For example: ENH220EXT IP address: 192.168.1.1

PCIPaddress:192.168.1.2–192.168.1.255

PC Subnet mask: 255.255.255.0



Apple Mac OS X

1. Go to **System Preferences** (Which can be opened in the Applications folder or selecting it in the Apple Menu).
2. Select **Network** in the **Internet & Network** section.

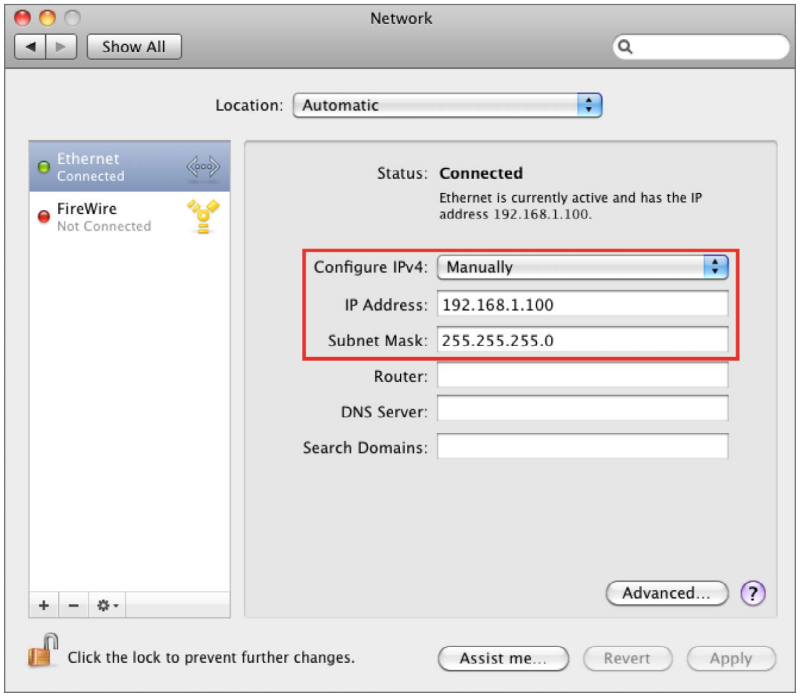
3. Highlight **Ethernet.**
4. In **Configure IPv4**, select **Manually.**
5. Enter an IP address that is different from the ENH220EXT and Subnet mask then press **OK.**

   Note: Ensure that the IP address and Subnet mask are on the same subnet as the device.

   For example: ENH220EXT IP address: 192.168.1.1

   PC IP address: 192.168.1.2 - 192.168.1.255

   PC Subnet mask: 255.255.255.0
6. Click **Apply** when done.



Hardware Installation

1. Connect one end of the Ethernet cable into the main LAN port (PoE) of the Access Point and the other end to the AP Ethernet port on the PoE injector.
2. Connect the **Power Adapter** to the **DC-IN** port of tl PoE injector and plug the other end into an electric outlet.
3. Connect the second Ethernet cable into the **LAN port** the PoE injector and the other end to the Ethernet pc on the computer.
4. Screw on the provided antennas to the device. Once both connections are secure, verify the following:

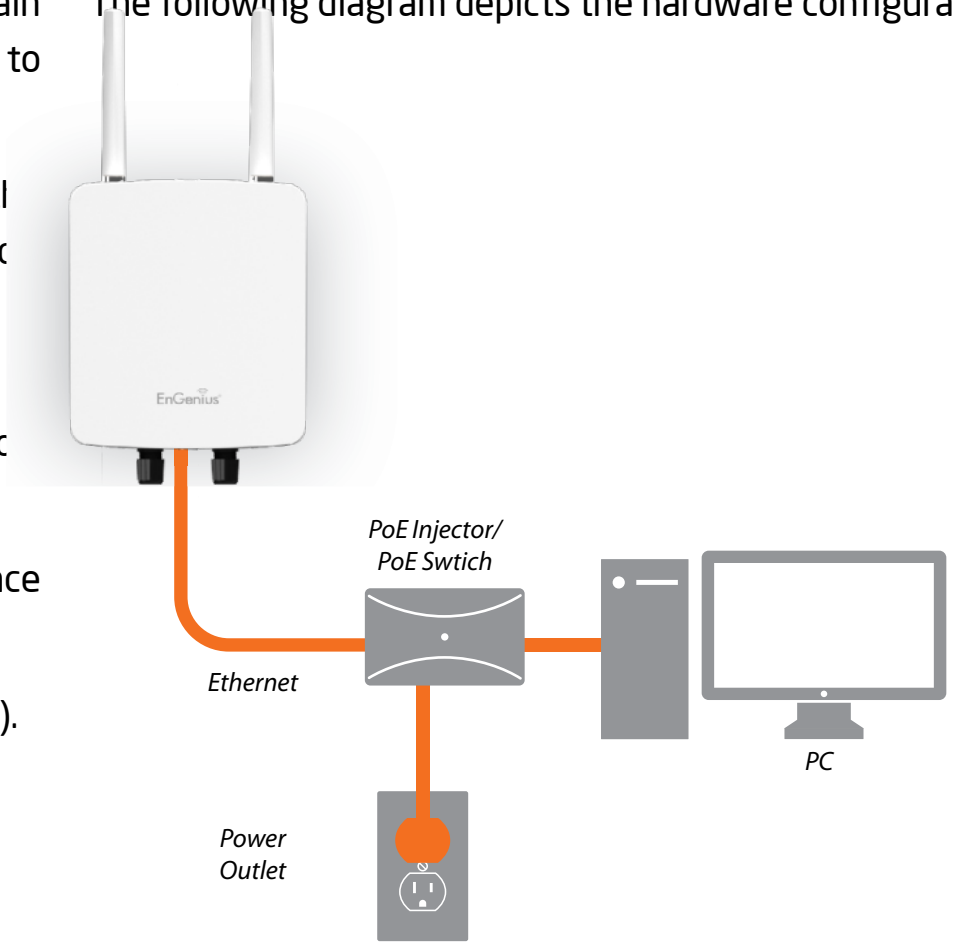
   a) Ensure that the **POWER** light is on (it will be green).

   b) Ensure that the WLAN light is on.

   c) Ensure that the LAN (Computer/ENH220EXT Connection) light is on (it will be green).

   d) Once all three lights are on, proceed to setup the Access Point using the computer.

The following diagram depicts the hardware configuration:

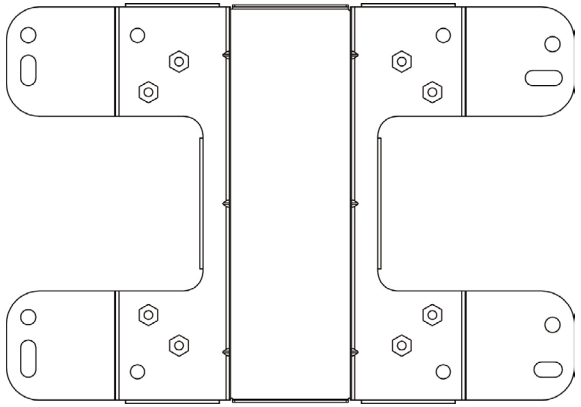


Note: The Access Point supports both IEEE 802.3at PoE (Power over Ethernet) or the included power injector. You may use either one as the power source. **Do NOT use both at the same time.**

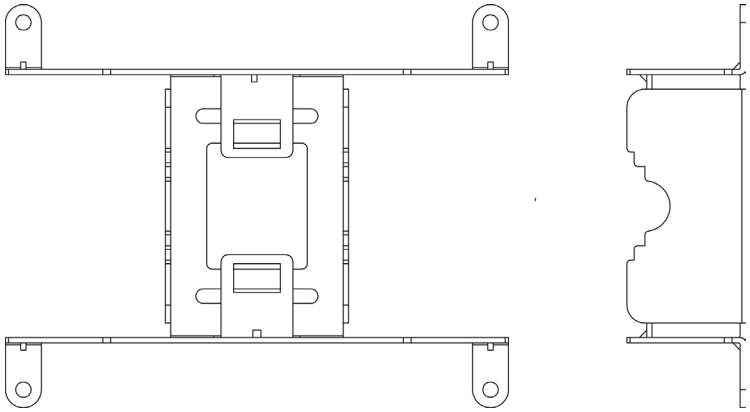
Mounting the ENH220EXT

Using the included accessories, the ENH220EXT can be attached to a wall or a pole.

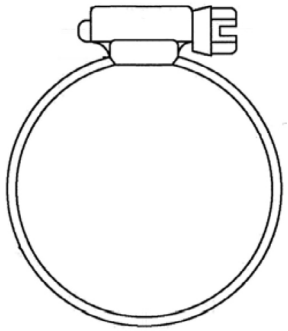
1. Wall Mount Kit: 260x180x7 (mm)
(10.2" x 7.09" x 0.28")



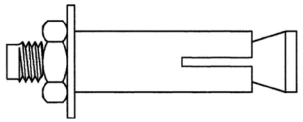
2. Pole Mount Kit 140x112x33 (mm)
(5.51" x 4.41" x 1.30")



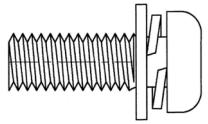
3. Pipe 63.5 (D) x 12.7 (mm)
(2.5"(D) x 0.5")



4. Tool 20(D) x 6 (mm)
(0.79"(D) x 0.24")

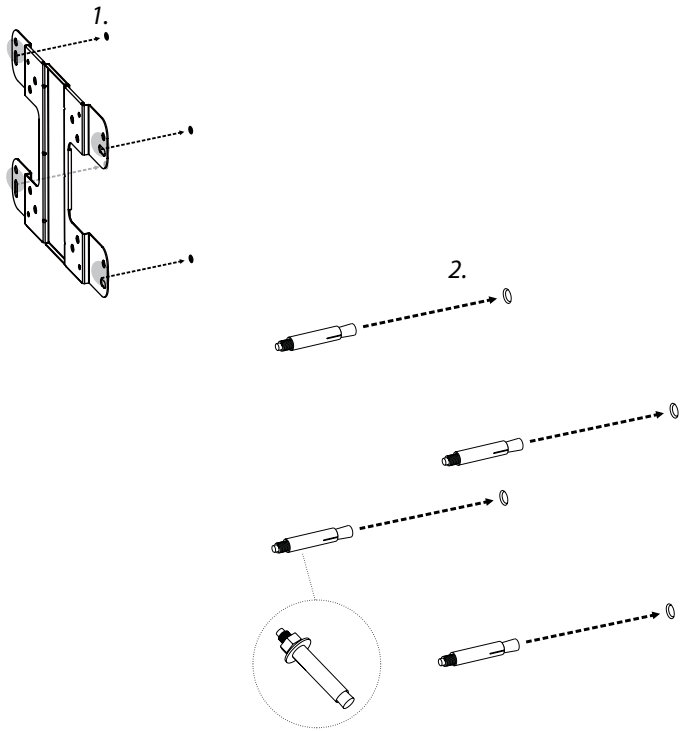


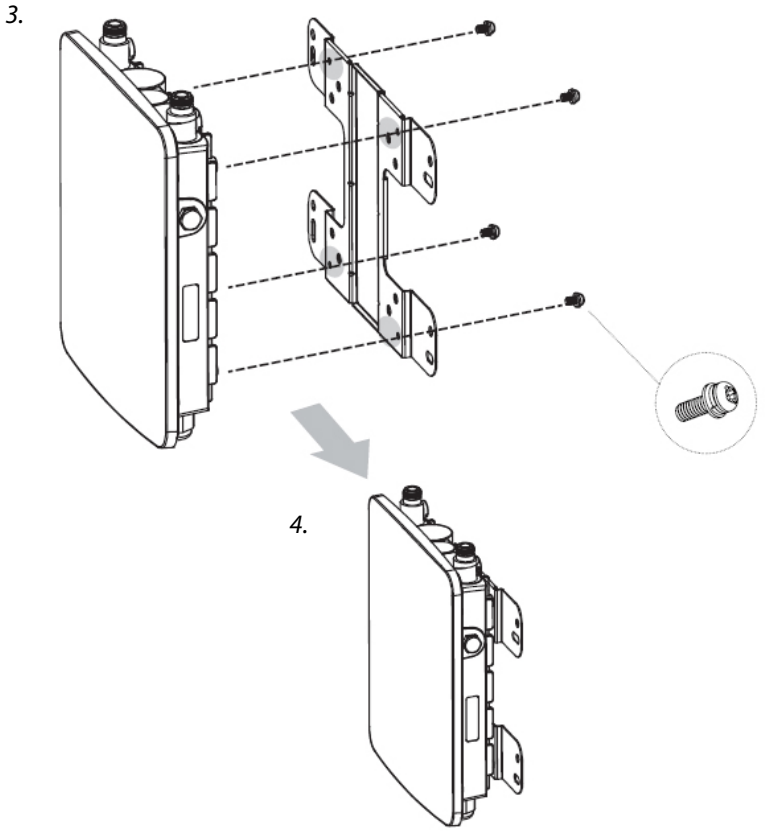
5. Screws: 6.5(D) x 9.95 (mm)
(0.26"(D) x 0.39")



To attach the ENH220EXT to a wall using wall mounting kit.

1. Mark the four locations of the mounting holes on the flat mounting surface.
2. Drill a 37 mm deep 8 mm hole in the markings and hammer the bolts into the openings.
3. Place the lock and flat washers on the four hex cap screws and drive the screws to attach the bracket to the back of the Access Point.
4. Tighten the flat washers to secure the bracket to the mounting surface.

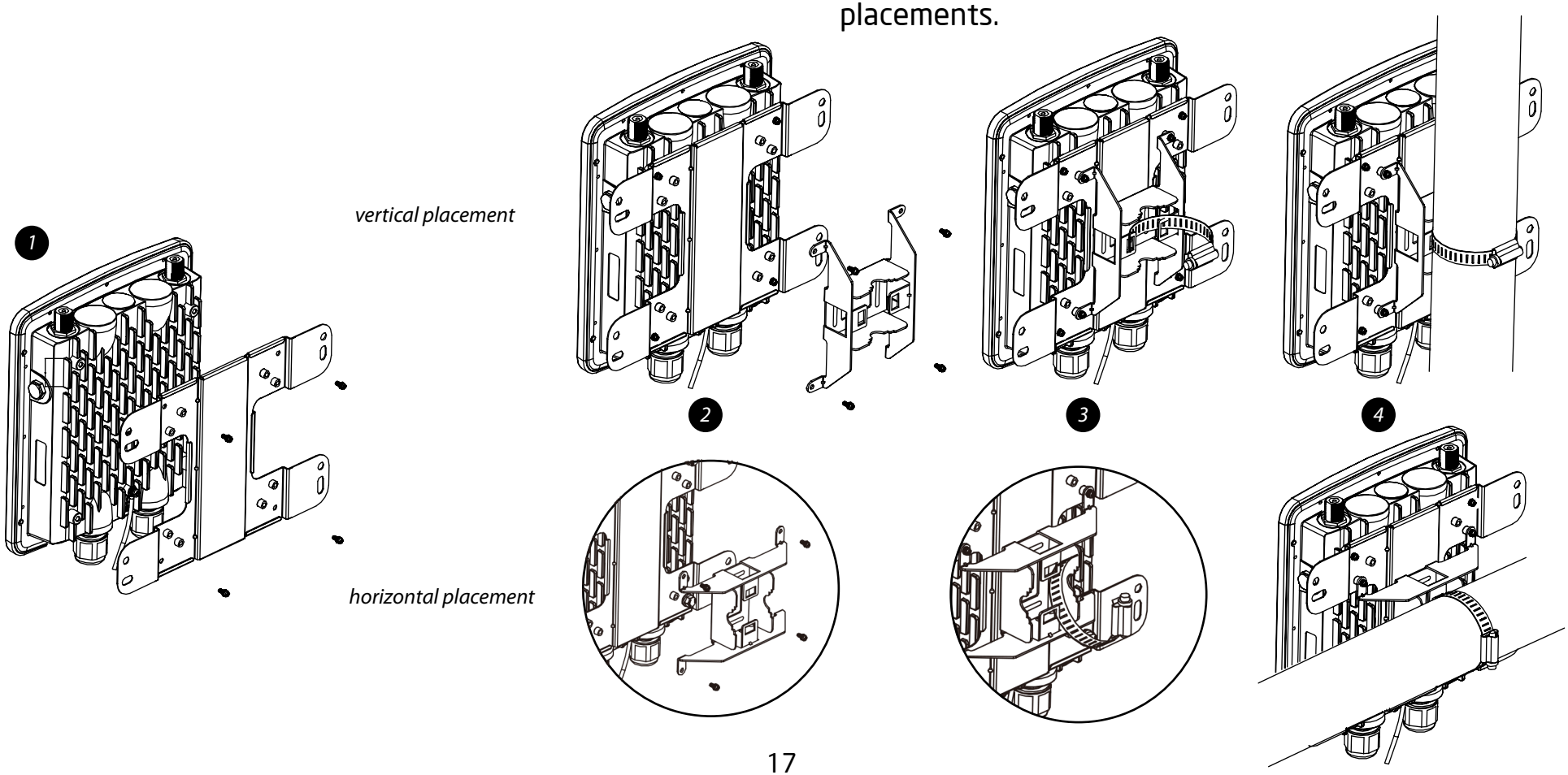




To attach the ENH220EXT to a pole using the provided pole mounting kit:

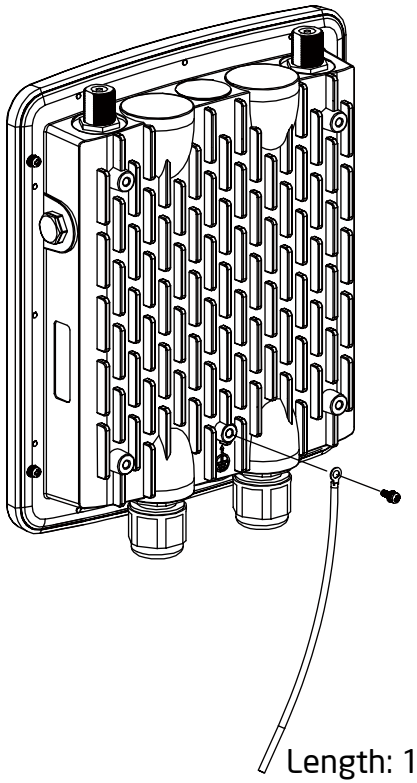
1. Place the lock and flat washers on the four hex cap screws and drive the screws to attach the bracket to the back of the Access Point.
2. Drive the four round head screws to attach the Pole Mount Bracket to the bracket.
3. Thread the open end of the Pole Strap through the two tabs on the Pole Mount Bracket .
4. Lock and tighten the Pole Strap to secure the Pole Mount Bracket to the pole.

   Note: See diagram below for vertical and horizonal placements.

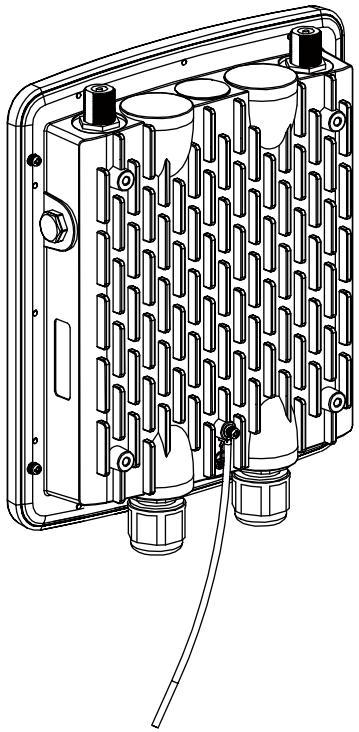


To install the ground cable on the ENH220EXT

1. Use the attached screws to pass the ground cable as shown in the figure below.



2. Assemble the ground cable on the device.



Chapter 3

Configuring Your Access Point

Configuring Your Access Point

This section will show you how to configure the device using the web-based configuration interface.

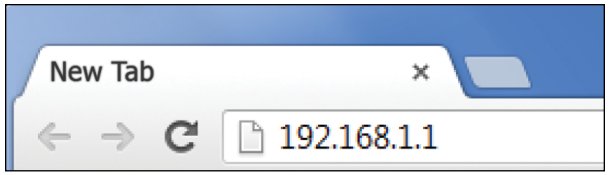
Default Settings

Please use your Ethernet port or wireless network adapter to connect the Access Point.

IP Address	192.168.1.1
Username / Password	admin / admin

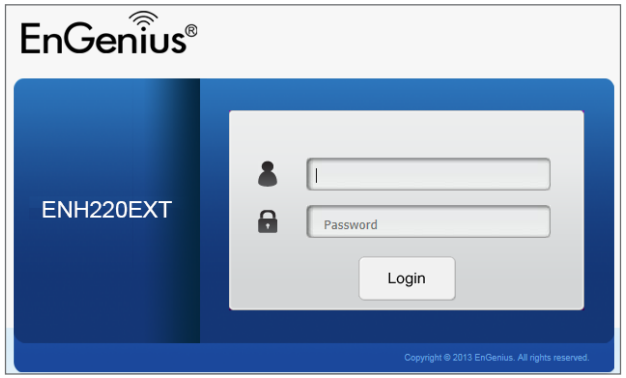
Web Configuration

1. Open a web browser (Internet Explorer/Firefox/Safari/ Chrome) and enter the IP Address **http://192.168.1.1**

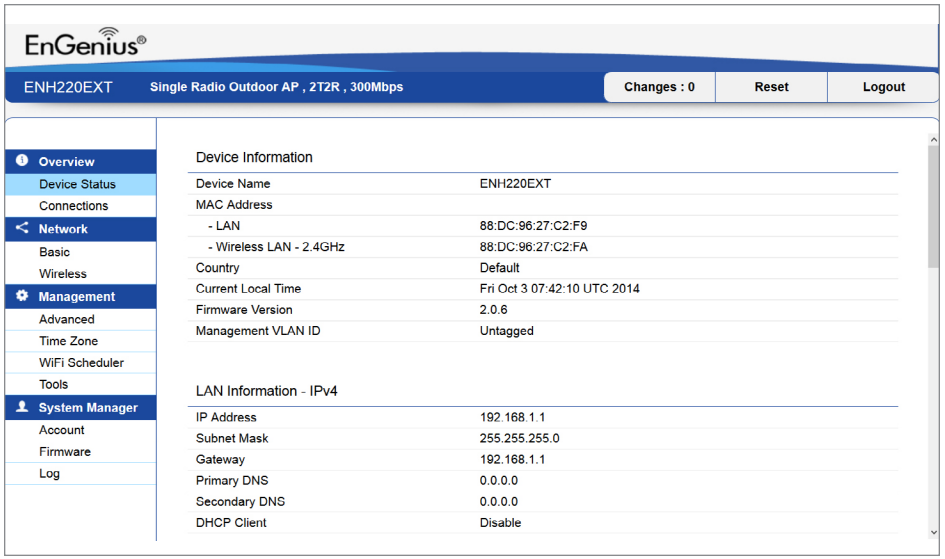


Note: If you have changed the default LAN IP Address of the Access Point, ensure you enter the correct IP Address.

2. The default username and password are **admin**. Once you have entered the correct username and password, click the **Login** button to open the web-base configuration page.



3. If successful, you will be logged in and see the ENH220EXT User Interface.



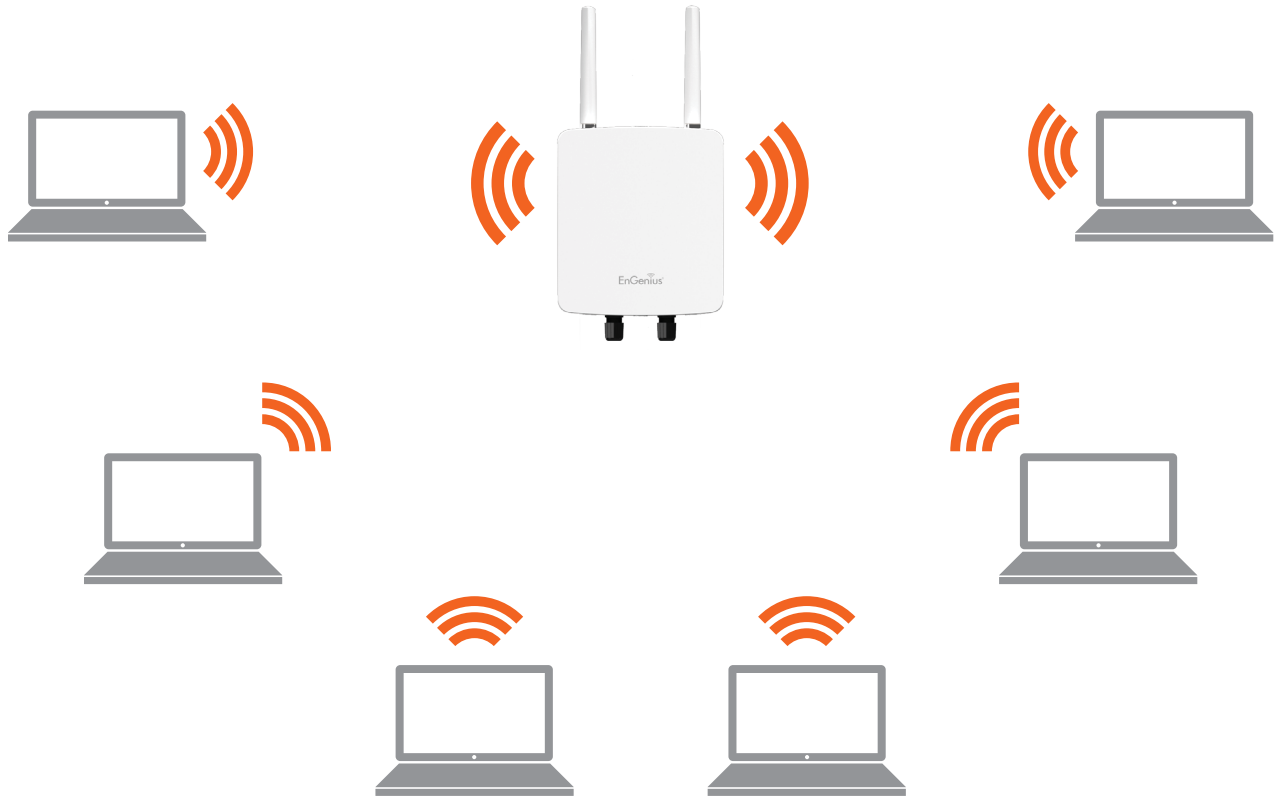
Chapter 4

Building a Wireless Network

The ENH220EXT has the ability to operate in various modes. This chapter describes the operating modes of the ENH220EXT.

Access Point Mode

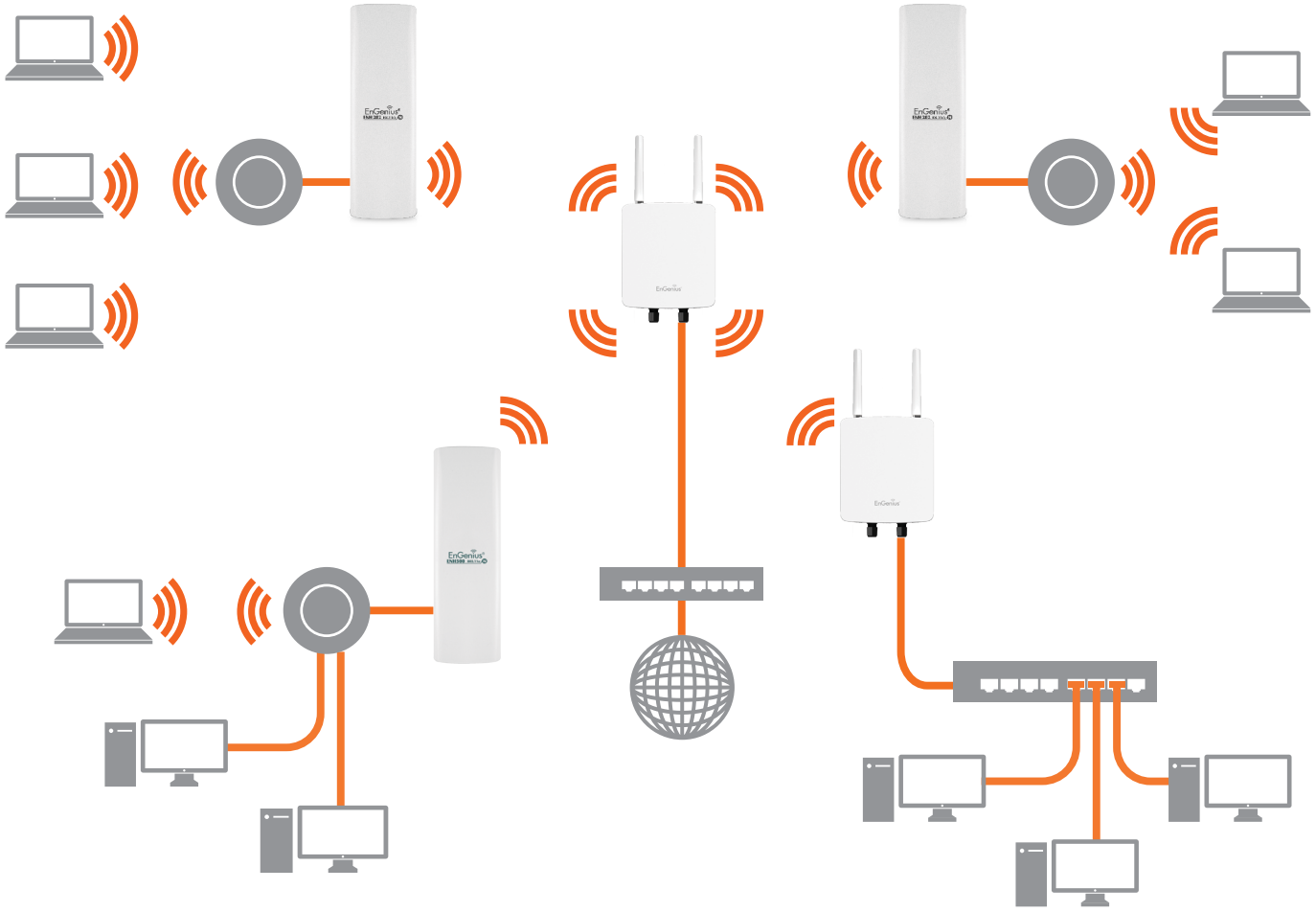
In Access Point Mode, ENH220EXT behaves likes a central connection for stations or clients that support IEEE 802.11b/g/n networks. The stations and clients must be configured to use the same SSID (Service Set Identifier) and security password to associate with the ENH220EXT. The ENH220EXT supports up to eight(8) SSIDs at the same time for secure access.



Client Bridge Mode

The ENH220EXT essentially acts as a wireless adapter that connects to an access point to allow a system of wireless access to the network in the Client Bridge mode. Since the computers are on the same subnet, the ENH220EXT can broadcast to reach all end-devices.

If you use the client bridge mode for the ENH220EXT, you can use the AP Detection feature to scan for Access Points within range. When you find an Access Point, configure the ENH220EXT to use the same SSID and Security Password as the Access Point to associate with it.



WDS AP Mode

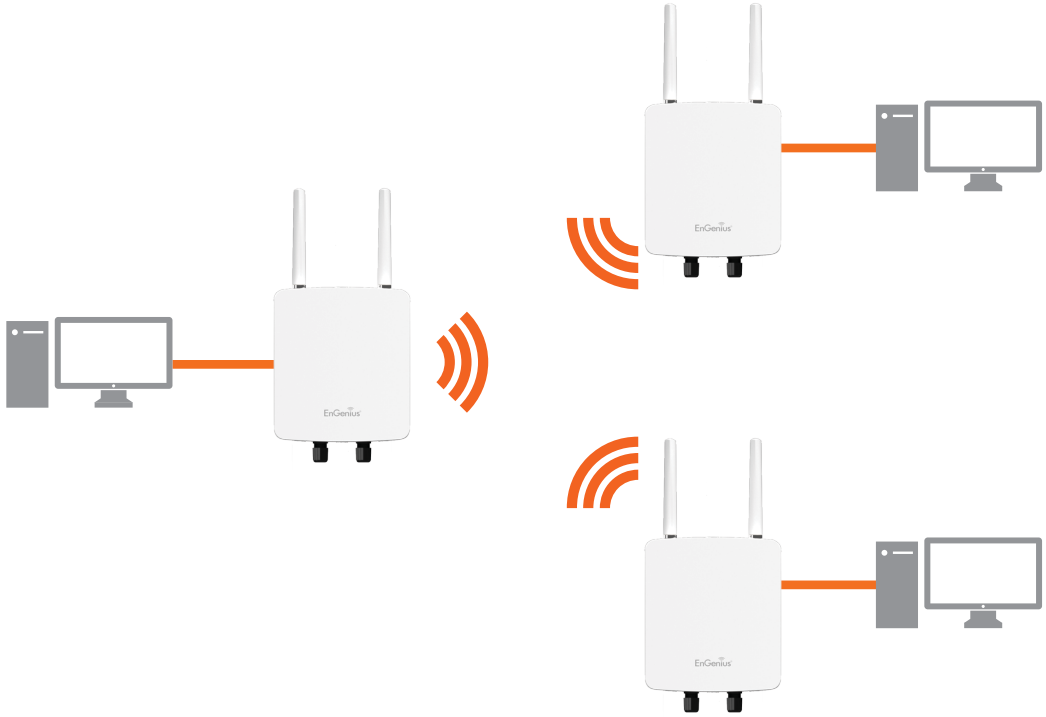
The ENH220EXT also supports WDS AP mode. This operating mode allows wireless connections to the ENH220EXT using WDS technology. In this mode, configure the MAC addresses in both Access Points to enlarge the wireless area by enabling WDS Link settings. WDS supports up to four (4) AP MAC addresses.

WDS Bridge Mode

In WDS Bridge Mode, the ENH220EXT can wirelessly connect different LANs by configuring the MAC address and security settings of each ENH220EXT device. Use this mode when two wired LANs located a small distance apart want to communicate with each other. The best solution is to use the ENH220EXT to wirelessly connect two wired LANs, as shown in the following diagram.

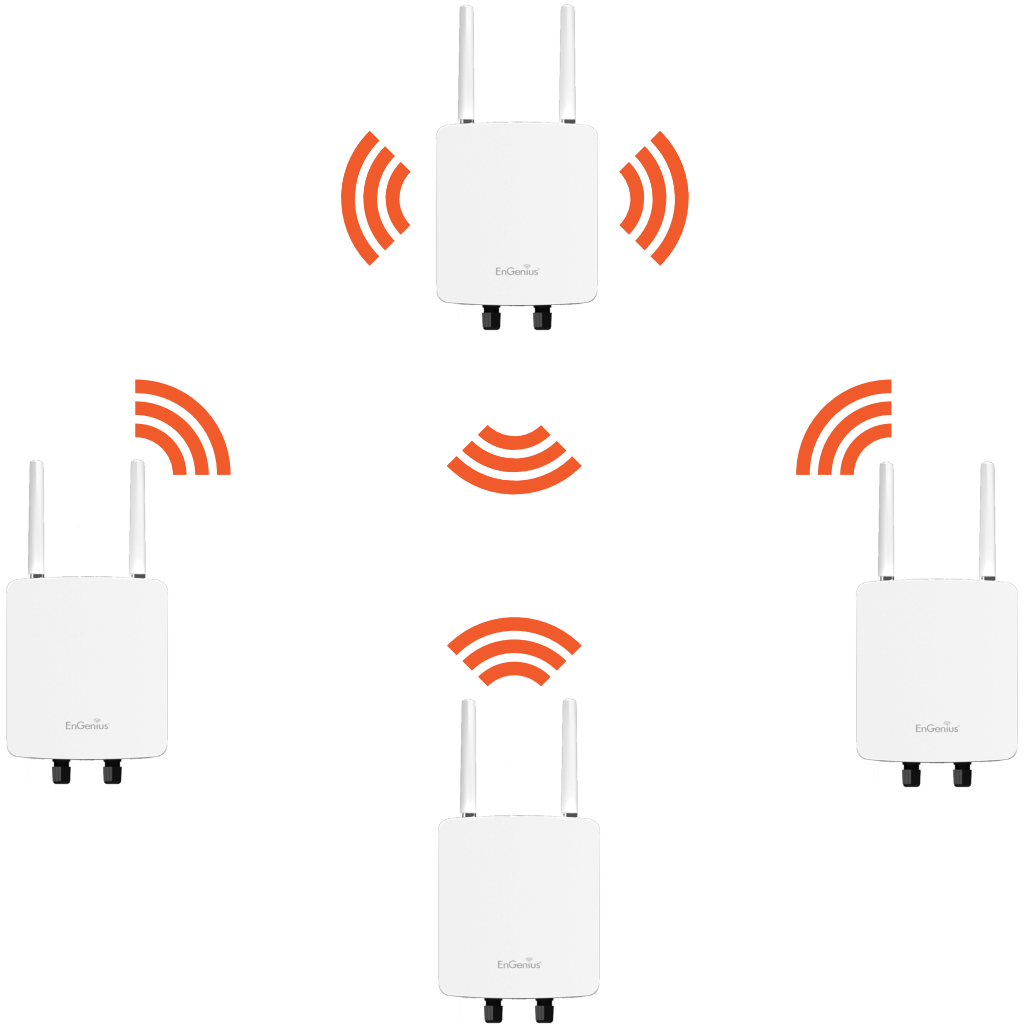
WDS Bridge Mode can establish up to four WDS links, creating a star-like network.

Note: WDS Bridge Mode does not act as an Access Point. Access Points linked by WDS are using the same frequency channel. More Access Points connected together may lower throughput. This configuration can be susceptible to generate endless network loops in your network, so it is recommended to enable the Spanning Tree function to prevent this from happening.



WDS Station Mode

Station mode expands the WDS by receiving a wireless signal/service and sharing it through the Ethernet port.

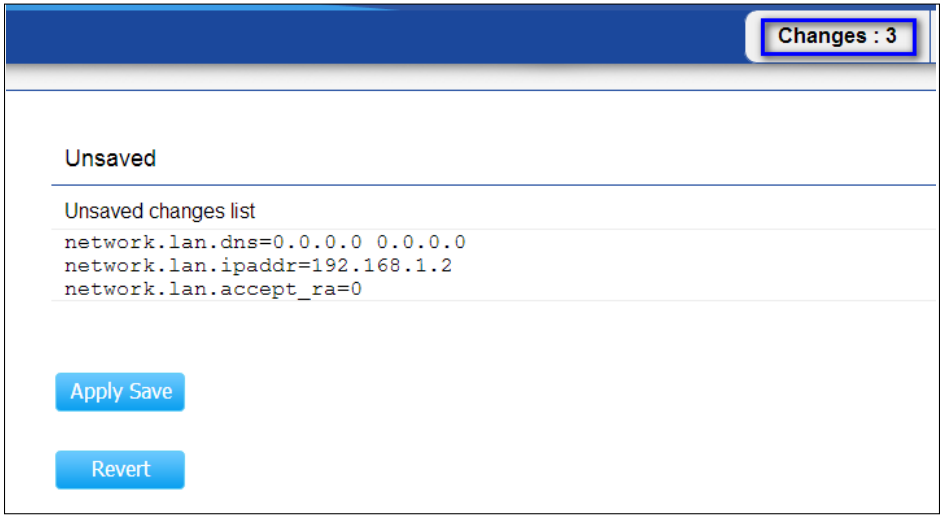


Chapter 5
Status

Main Status

Save Changes

This page lets you save and apply the settings shown under **Unsaved changes list**, or cancel the unsaved changes and revert to the previous settings that were in effect.



Device Status

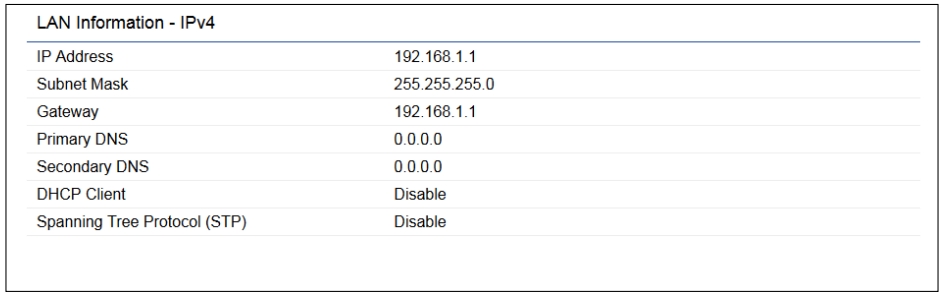
Clicking the **Device Status** link under the **Overview** menu shows the status information about the current operating mode.

- The **Device Information** section shows general system information such as Device Name, MAC Address, Current Time, Firmware Version, and Management VLAN ID.

  Note: VLAN ID information is only applicable in Access Point or WDS AP mode.

Device Information	
Device Name	ENH220EXT
MAC Address	
- LAN	88:DC:96:27:C2:F9
- Wireless LAN - 2.4GHz	88:DC:96:27:C2:FA
Country	Default
Current Local Time	Fri Oct 3 07:42:10 UTC 2014
Firmware Version	2.0.6
Management VLAN ID	Untagged

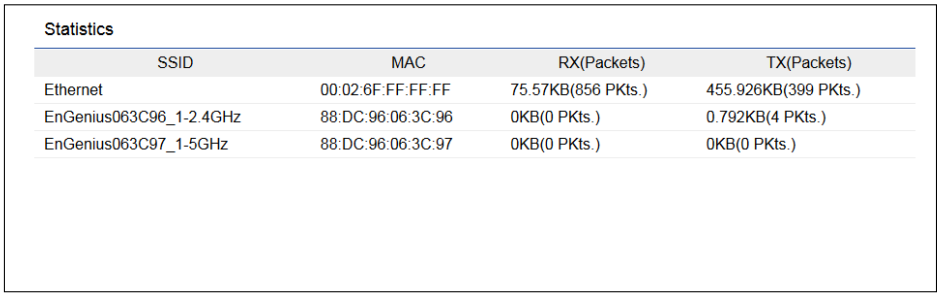
- The **LAN Information** section shows the Local Area Network settings such as the LAN IP Address, Subnet mask, and DNS Address.



LAN Information - IPv4

IP Address	192.168.1.1
Subnet Mask	255.255.255.0
Gateway	192.168.1.1
Primary DNS	0.0.0.0
Secondary DNS	0.0.0.0
DHCP Client	Disable
Spanning Tree Protocol (STP)	Disable

- The **Statistics** section shows Mac information such as SSID, MAC address, RX and TX.

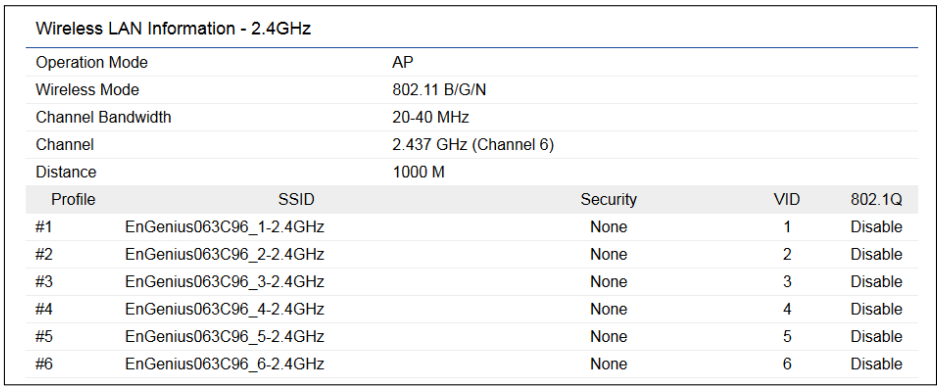


Statistics

SSID	MAC	RX(Packets)	TX(Packets)
Ethernet	00:02:6F:FF:FF:FF	75.57KB(856 PKts.)	455.926KB(399 PKts.)
EnGenius063C96_1-2.4GHz	88:DC:96:06:3C:96	0KB(0 PKts.)	0.792KB(4 PKts.)
EnGenius063C97_1-5GHz	88:DC:96:06:3C:97	0KB(0 PKts.)	0KB(0 PKts.)

- The **Wireless LAN Information 2.4 GHz** section shows wireless information such as Operating Mode, Frequency, and Channel. Since the ENH220EXT supports multiple-SSIDs, information about each SSID, the ESSID, and security settings, are displayed.

  Note: Profile Settings are only applicable in Access Point and WDS AP modes.



Wireless LAN Information - 2.4GHz

Operation Mode	AP
Wireless Mode	802.11 B/G/N
Channel Bandwidth	20-40 MHz
Channel	2.437 GHz (Channel 6)
Distance	1000 M

Profile	SSID	Security	VID	802.1Q
#1	EnGenius063C96_1-2.4GHz	None	1	Disable
#2	EnGenius063C96_2-2.4GHz	None	2	Disable
#3	EnGenius063C96_3-2.4GHz	None	3	Disable
#4	EnGenius063C96_4-2.4GHz	None	4	Disable
#5	EnGenius063C96_5-2.4GHz	None	5	Disable
#6	EnGenius063C96_6-2.4GHz	None	6	Disable

Connection

2.4 GHz Connection List

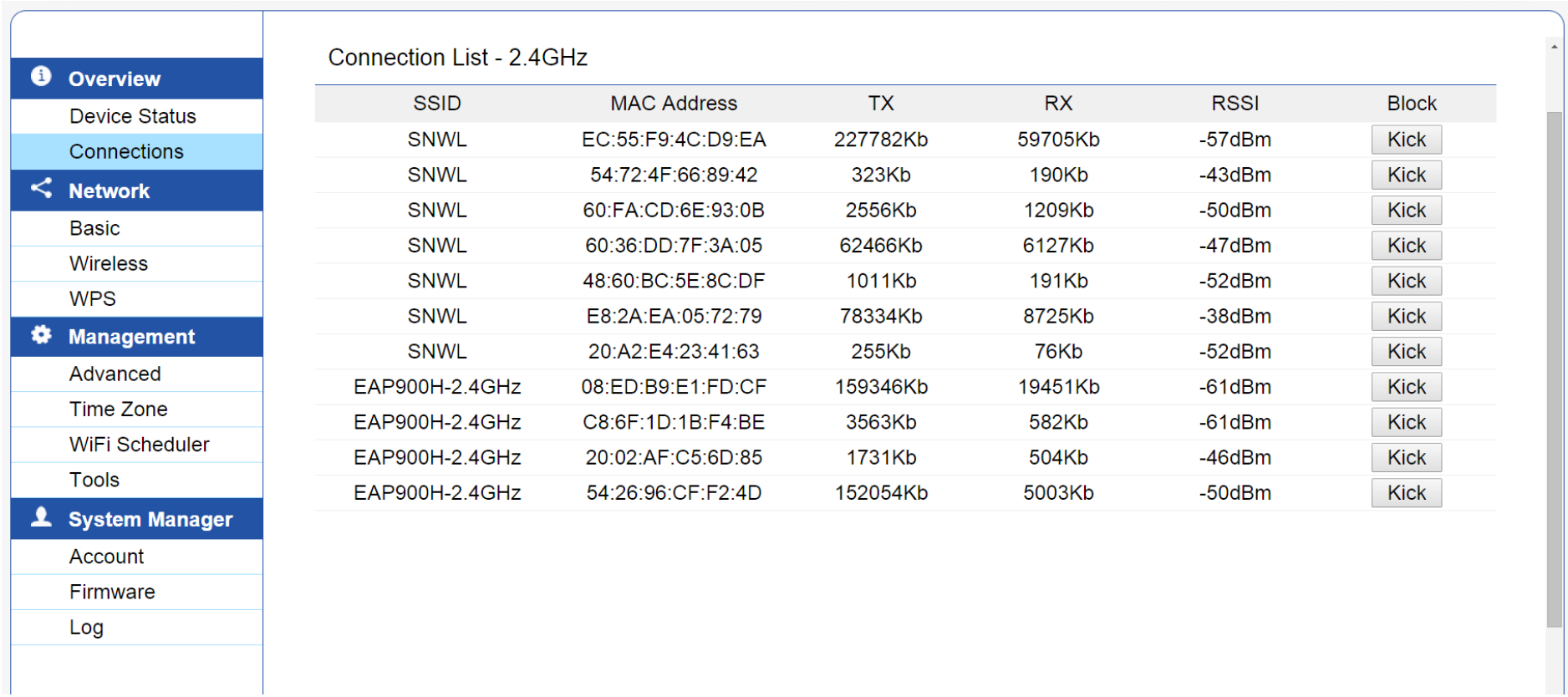
Click the **connection** link under the **Overview** menu displays the connection list of clients associated to the ENH220EXT, along with the MAC addresses and signal strength for each client. Clicking **Refresh** updates the client list.

Note: Only applicable in Access Point and WDS AP modes.

2.4 GHz WDS Link List

Click the connection link under the Overview menu. This page displays the current status of the WDS link, including WDS Link ID, MAC Address, Link Status and RSSI.

Note: Only applicable in WDS AP and WDS Bridge modes.



Client Bridge Connection Status

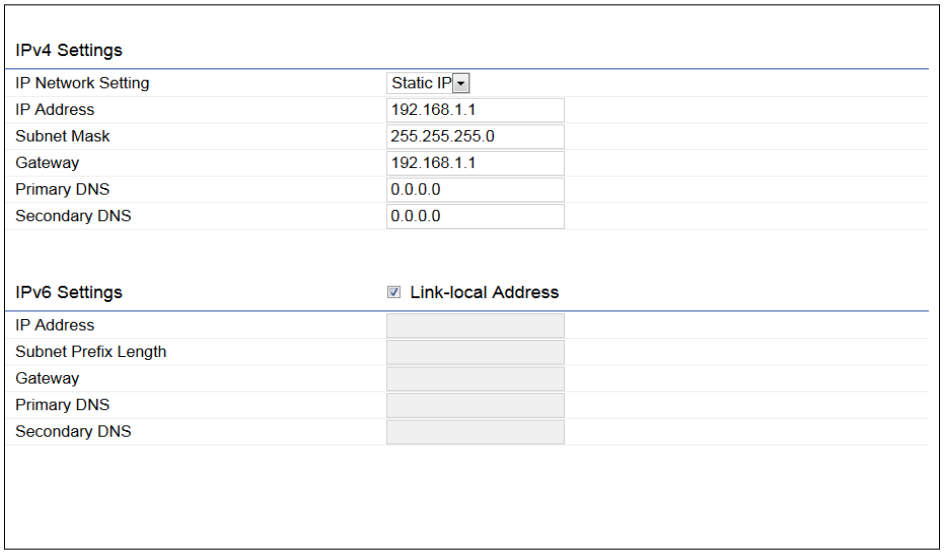
Click the **Connection** link under the **Overview** menu. This page displays the connection status between the Access Point, including associated the SSID, BSSID, connection status, wireless mode, current channel, security, Tx Data Rate(Mbps), Current noise level and signal strength.

Chapter 6
Network

Basic IP Settings

IPv4/IPv6 Settings

This page allows you to modify the device's IP settings.



IP Network Settings: Select whether the device's IP address will use a static IP address specified in the IP address field or be obtained automatically when the device connects to a DHCP server.

IP Address: The IP address of this device.

Subnet Mask: The IP Subnet mask of this device.

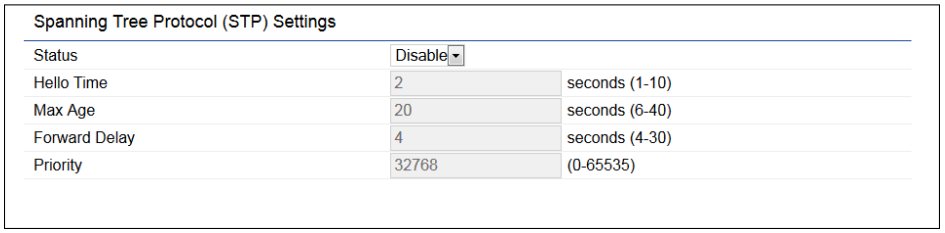
Gateway: The Default Gateway of this device. Leave it blank if you are unsure of this setting.

Primary/Secondary DNS: The primary/secondary DNS address for this device.

Save: Click **Save** to confirm the changes.

Spanning Tree Protocol (STP) Settings

This page allows you to modify the Spanning Tree settings. Enabling the Spanning Tree protocol will prevent network loops in your LAN network.



Spanning Tree Status: Enables or disables the Spanning Tree function.

Hello Time: Specifies Bridge Hello Time in seconds. This value determines how often the device sends handshake packets to communicate information about the topology throughout the entire Bridged Local Area Network.

Max Age: Specifies Bridge Max Age in seconds. If another bridge in the spanning tree does not send a hello packet for a long period of time, it is assumed to be inactive.

Forward Delay: Specifies Bridge Forward Delay in seconds. Forwarding delay time is the time spent in each of the Listening and Learning states before the Forwarding state is entered. This delay is provided so that when a new bridge comes onto a busy network, it analyzes data traffic before participating in the network.

Priority: Specifies the Priority Number. A smaller number has a greater priority than a larger number.

Save: Click **Save** to confirm the changes.

Chapter 7

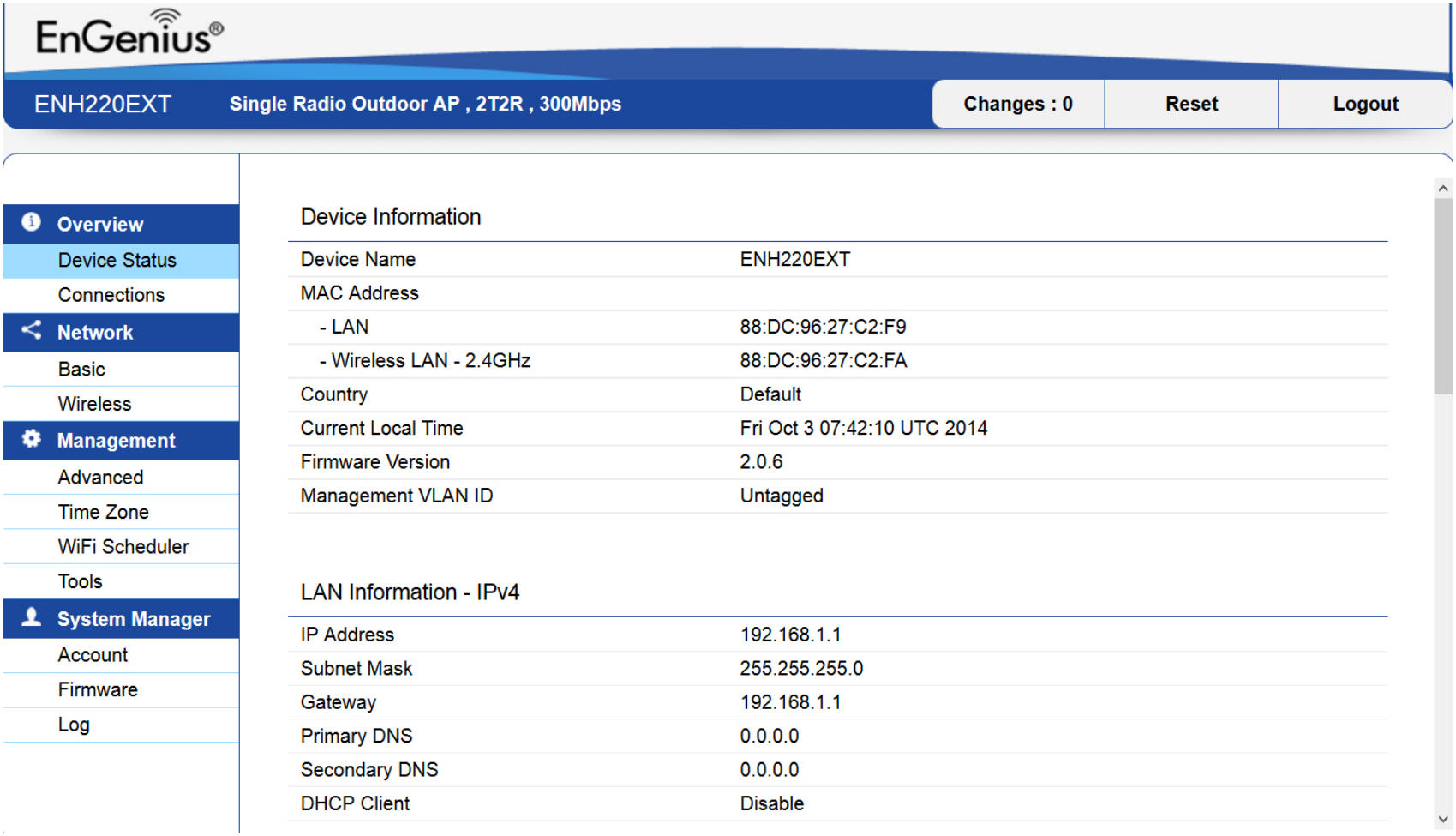
2.4 GHz Wireless

Wireless

Wireless Settings

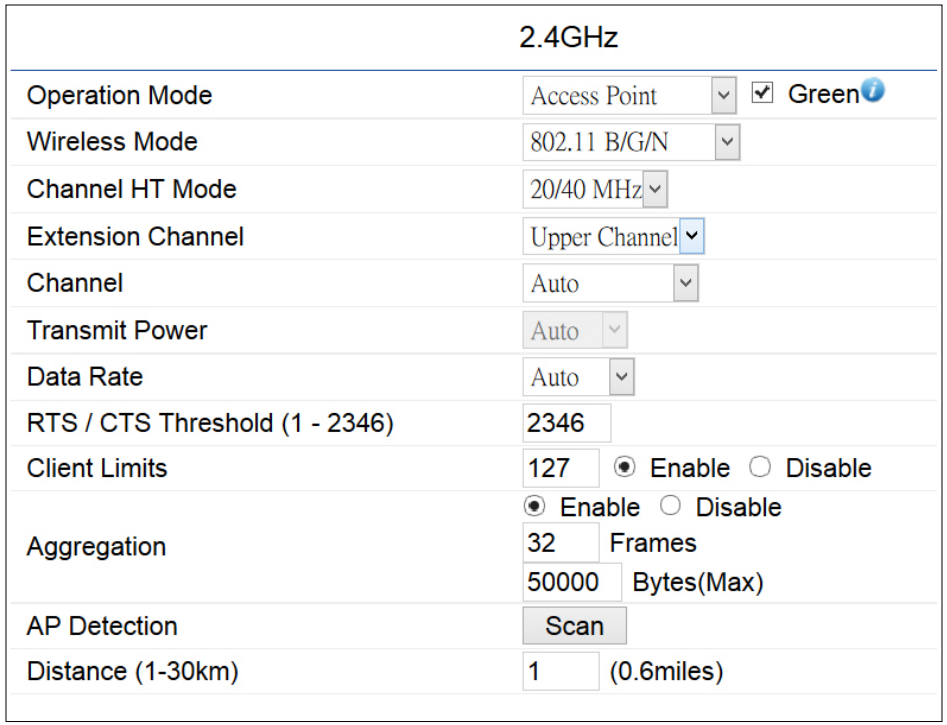
Device Name: Enter a name for the device. The name you type appears in SNMP management. This name is not the SSID and is not broadcast to other devices.

Save: Click **Save** to confirm the changes.



This page displays the current status of the Wireless settings of the ENH220EXT.

2.4 GHz Wireless Network



Operation Mode: Select **Operation Mode**. The ENH220EXT supports multi-operation modes: Access Point, Client Bridge, or WDS(WDS AP, WDS Bridge, and WDS Station).

Wireless Mode: Supports 802.11b/g/n mixed mode in 2.4 GHz.

Channel HT Mode: The default channel bandwidth is 20 MHz/ 40 MHz. The larger the channel, the greater the transmission quality and speed.

Extension Channel: Select the **upper** or **lower** channel. Your selection may affect the Auto channel function.

Channel: Select the approriate channel and frequency. Select **Auto** to enable auto-channel selection.

Transmit Power: Sets the power output of the wireless signal.

Data Rate: Select a data rate from the drop-down list. The data rate affects throughput of data in the ENH220EXT. Select the best balance for you and your network but note that the lower the data rate, the lower the throughput, though transmission distance is also lowered.

RTS/CTS Threshold: Specifies the threshold package size for RTC/CTS. A small number causes RTS/CTS packets to be sent more often and consumes more bandwidth.

Client Limits: Limits the total number of clients.

Aggregation: Merges data packets into one packet. This

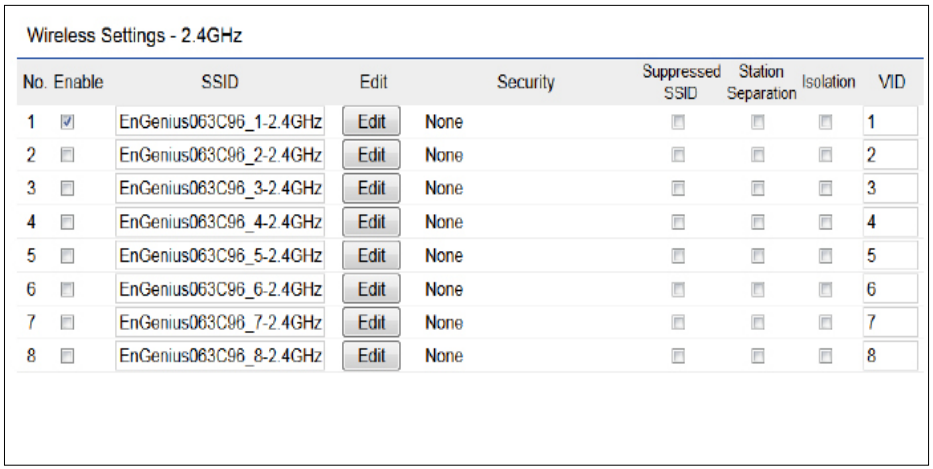
option reduces the number of packets, but also increases packet sizes.

AP Detection: AP Detection can select the best channel to use by scanning nearby areas for Access Points.

Distance: Specifies the distance between Access Points and clients. Note that longer distances may drop higher-speed connections.

Save: Click **Save** to confirm the changes or **Cancel** to cancel and return to previous settings.

2.4 GHz SSID Profile



Current Profile: You can configure up to eight (8) different SSIDs (eight (8) per band). If multiple client devices will be accessing the network, you can arrange the devices into SSID groups. Click **Edit** to configure the profile and check whether you want to enable extra SSID.

SSID: Specifies the SSID for the current profile.

Suppressed SSID: Check this option to hide the SSID from clients. If checked, the SSID will not appear in the site survey.

Station Separation: Click the appropriate radio button to allow or prevent communication between client devices.

VID: Specifies the VLAN tag for each profile. If your netowrk includes VLANs, you can specify a VLAN ID for packets pass through the Access Point with a tag.

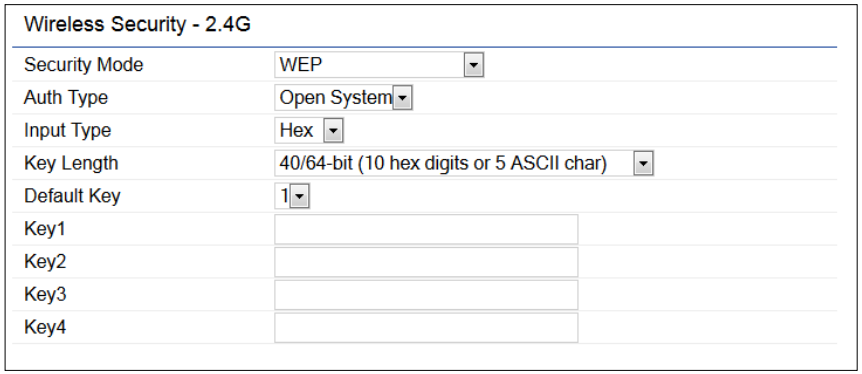
Wireless Security: See the Wireless Security section.

Isolation: Restrict clients communicating with different VIDs by selecting the radio button.

Save: Click **Save** to accept the changes.

Wireless Security

The Wireless Security section lets you configure the ENH220EXT's security modes: WEP, WPA-PSK, WPA2-PSK, WPA-PSK Mixed, WPA, WPA2, and WPA Mixed. It is strongly recommend that you use WPA2-PSK.



Auth Type: Select **Open System** or **Shared Key**.

Input Type:

ASCII: Regular Text (recommended)

Hexadecimal Numbers: (For advanced users)

Key Length: Select the desired option and ensure that wireless clients use the same setting. Your choices are 64, 128, and 152-bit password lengths.

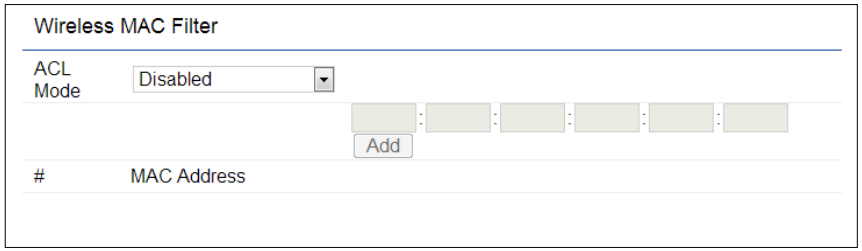
Default Key: Select the Key you wish to be the default. Transmitted data is **ALWAYS** encrypted using the Default Key; the other Keys are for decryption only. You must enter a Key Value for the Default Key.

Encryption Key Number: Enter the Key Value or values you wish to use. Only the Key selected as Default is required. The others are optional.

Wireless MAC Filtering

Wireless MAC Filtering is used to allow or deny network access to wireless clients (computers, tablet PCs, NAS, smartphones, etc.) according to their MAC addresses. You can manually add a MAC address to restrict permission to access the ENH220EXT. The default setting is: **Disable Wireless MAC Filter**.

Note: Only applicable in Access Point and WDS AP modes.



ACL Mode: Determines whether network access is granted or denied to clients whose MAC addresses appear in the MAC address table on this page. Your choices are: Disabled, Deny MAC in the list, or Allow MAC in the list.

MAC Address: Enter the MAC address of the wireless client.

Add: Click **Add** to add the MAC address to the MAC address table.

Delete: Delete the selected entries.

Save: Click **Save** to apply the changes.

Wireless Advanced

Wireless Traffic Shaping

Traffic shaping regulates the flow of packets leaving an interface to deliver improved Quality of Service.

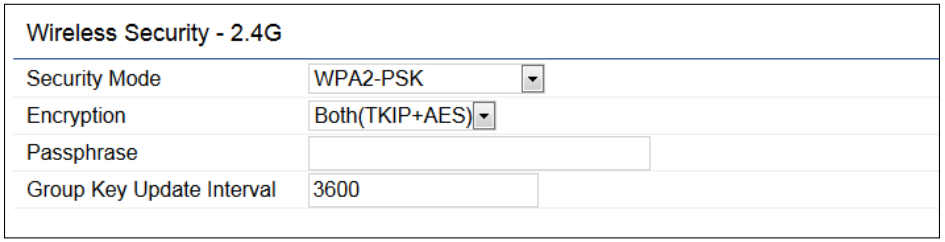
Enable Traffic Shaping: Check this option to enable Wireless Traffic Shaping.

Download Limit: Specifies the wireless transmission speed used for downloading.

Upload Limit: Specifies the wireless transmission speed used for uploading.

Save: Click **Save** to confirm the changes.

WPA-PSK (WPA Pre-Shared Key) Encryption:

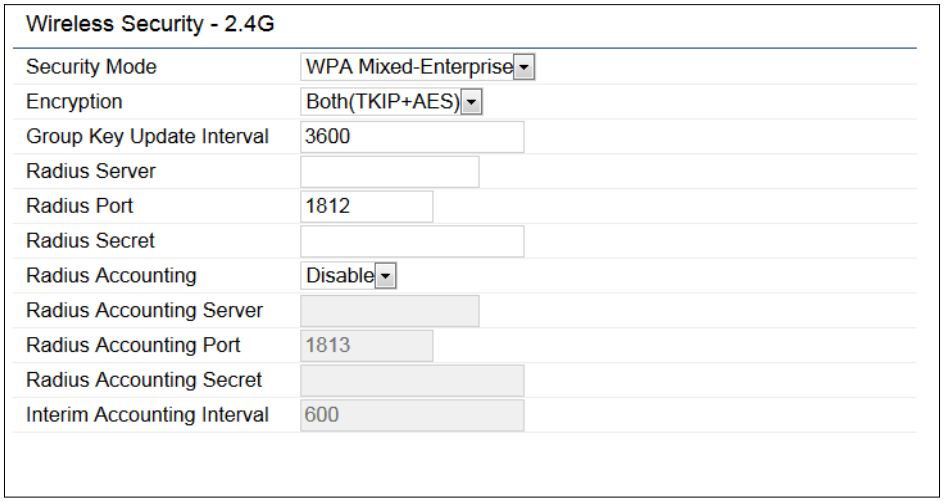


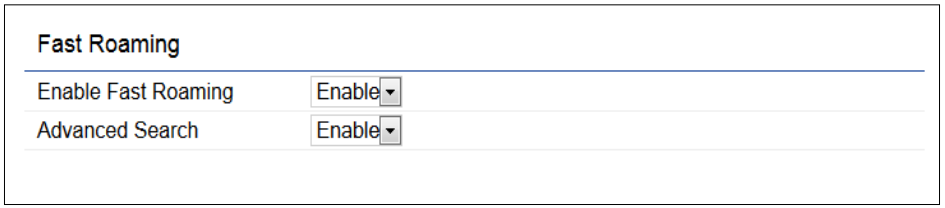
Encryption: Select the WPA encryption type you would like. Please ensure that your wireless clients use the same settings.

Passphrase: Wireless clients must use the same Key to associate the device. If using ASCII format, the Key must be from 8 to 63 characters in length. If using HEX format, the Key must be 64 HEX characters in length.

Group Key Update Interval: Specifies how often, in seconds, the Group Key changes.

WPA Mixed-Enterprise: Access Point / WDS AP mode





Encryption: Select the WPA encryption type you would like. Please ensure that your wireless clients use the same settings.

Radius Server: Enter the IP address of the Radius server.

Radius Port: Enter the port number used for connections to the Radius server.

Radius Secret: Enter the secret required to connect to the Radius server.

Group Key Update Interval: Specifies how often, in seconds, the Group Key changes.

Radius Accounting: Enable or disable Radius accounting feature.

Radius Accounting Server: Enter the IP address of the Radius accounting server.

Radius Accounting Port Enter the port number used for connections to the Radius accounting server.

Radius Accounting Secret: Enter the secret required to connect to the Radius accounting server.

Interim Accounting Interval: Specifies how often, in seconds, the accounting data sends.

> **Note:** 802.11n does not allow WEP/WPA-PSK TKIP/ WPA2-PSK TKIP security mode. The connection mode will automatically change from 802.11n to 802.11g.

Fast Roaming: Enable Fast Roaming to serve mobile client devices that roam from Access Point to Access Point. Some applications running on Client devices require fast re-association when they roam to a different Access Point. Voice application.

WDS Link Settings

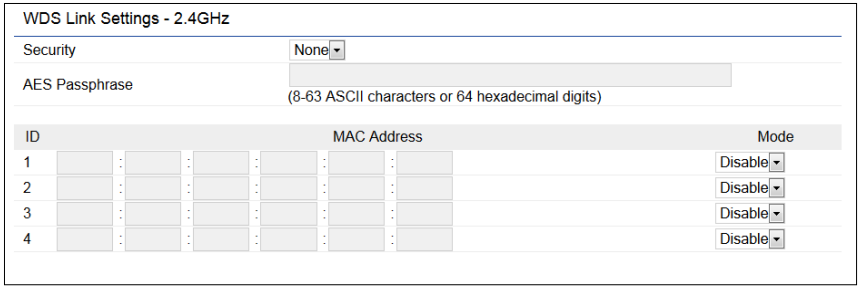
Using the WDS (Wireless Distribution System) feature will allow a network administrator or installer to connect to Access Points wirelessly. Doing so will extend the wired infrastructure to locations where cabling is not possible or inefficient to implement.

> **Note:** Compatibility between different brands and models of Access Points is not guaranteed. It is recommended that the WDS network be created using the same models for maximum compatibility.
>
> **Also note:** All Access Points in the WDS network need to use the same Channel and Security settings.

To create a WDS network, please enter the MAC addresses of the Access Points that you want included in the WDS. There can be a maximum of four (4) Access Points.

> **Note:** Only applicable in WDS AP and WDS Bridge modes.

2.4 GHz WDS Link Settings



Security: Select **None** or **AES** from the drop-down list.

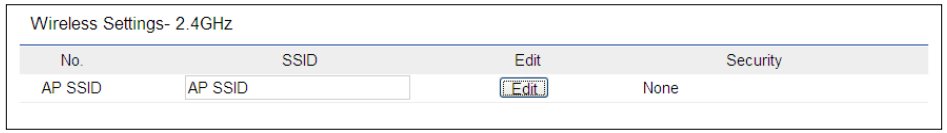
AES Passphrase: Enter the Key Values you wish to use. Other Access Points must use the same Key to establish a WDS link.

MAC Address: Enter the Access Point's MAC address to where you want to extend the wireless area.

Mode: Select to disable or enable from the drop-down list.

Save: Click **Save** to confirm the changes.

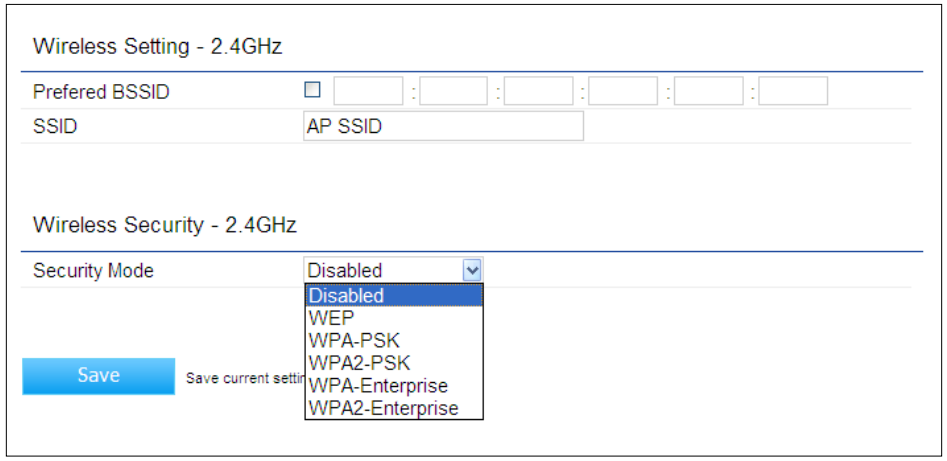
Client Bridge Setting



No.: Display the setting value.

SSID: You can implement the AP detection to select the proper SSID.

Edit: Click **Edit** to configure the advanced settings for the SSID.



Prefer BSSID: You can insert the prefer BSSID or enter the specific SSID to be associated with the Access Point.

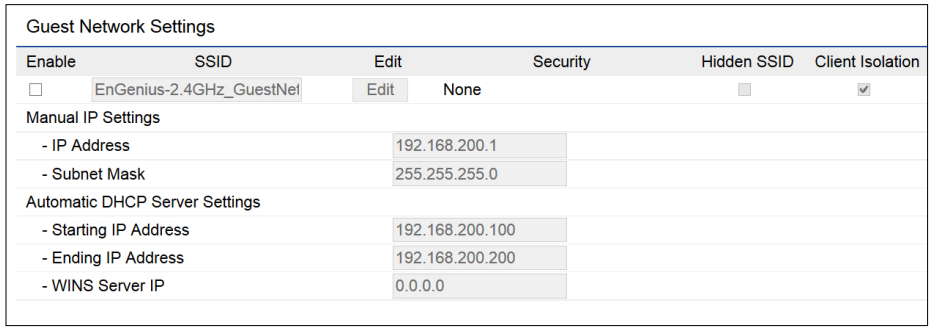
SSID: You can implement the AP detection to select the proper SSID.

Security Mode: Select the correct security mode and insert the correct encryption type. Please refer the wireless security section in page 42.

Save: Click **Save** to accept the changes

Guest Network Settings

Adding a guest network allows visitors to use the Internet without giving out your office or company wireless security key.



SSID: Specifies the SSID for the current profile.

Suppressed SSID: Check this option to hide the SSID from clients. If checked, the SSID will not appear in the site survey.

Station Separation: Click the appropriate radio button to allow or prevent communication between client devices.

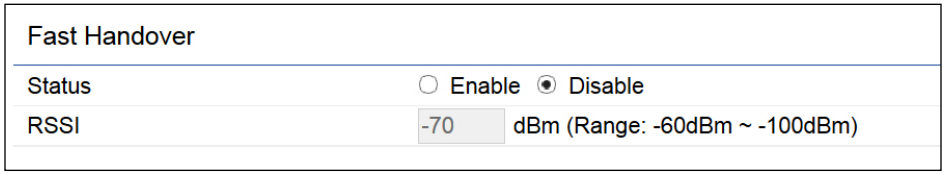
IP Address: The IP Address of this device.

Subnet Mask: The IP Subnet mask of this device.

Starting IP Address: The first IP Address in the range of the addresses by the DHCP server.

Ending IP Address: The last IP Address in the range of addresses assigned by the DHCP server.

Fast Handover



Fast Handover: Enable the Fast Handover feature by ensuring that each client is served by at least one Access Point at any time. Access Points continuously monitor the connectivity quality of any client in their range and efficiently share this information with other Access Points in the vincinity of that client to coordinate which of them should serve the client best.

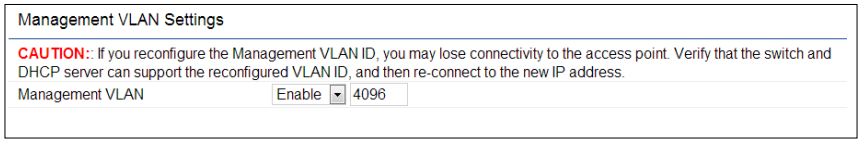
RSSI: Enter the RSSI (Received Signal Strength Index) in order to determine the handover procedure which the current wireless link will terminate. RSSI is an indication of the power level being received by the antenna. Therefore, the higher the RSSI number, the stronger the signal.

Chapter 8
Management

Management VLAN Settings

This page allows you to assign a VLAN tag to packets sent over the network. A VLAN is a group of computers on a network whose software has been configured so that they behave as if they were on a separate Local Area Network (LAN). Computers on VLAN do not have to be physically located next to one another on the LAN.

Note: Only applicable in Access Point and WDS AP modes.



Management VLAN: If your network includes VLANs, you can enable **Management VLAN ID** for packets passing through the Access Point with a tag.

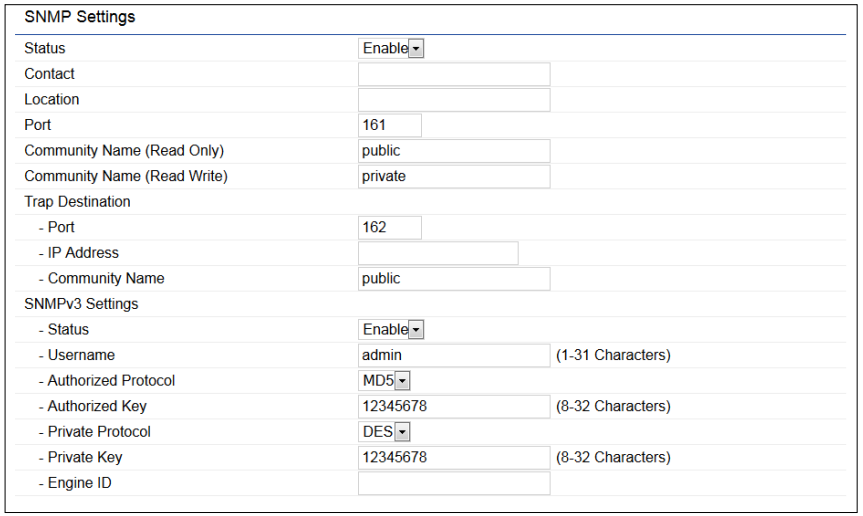
Save: Click **Save** to confirm the changes or **Cancel** to cancel and return to previous settings.

Note: If you reconfigure the Management VLAN ID, you may lose your connection to the ENH220EXT. Verify that the DHCP server supports the reconfigured VLAN ID and then reconnect to the ENH220EXT using the new IP address.

Advanced Settings

SNMP Settings

This page allows you to assign the Contact Details, Location, Community Name, and Trap Settings for a Simple Network Management Protocol (SNMP). SNMP is a networking management protocol used to monitor network attached devices. SNMP allows messages (called protocol data units) to be sent to various parts of the network. Upon receiving these messages, SNMP compatible devices (called agents) returns the data stored in their Management Information Bases.



SNMP Enable/Disable: Enables or disables the SNMP feature.

Contact: Specifies the contact details of the device.

Location: Specifies the location of the device.

Community Name (Read Only): Specifies the password for the SNMP community for read only access.

Community Name (Read/Write): Specifies the password for the SNMP community with read/write access.

Trap Destination Address: Specifies the IP address of the computer that will receive the SNMP traps.

Trap Destination Community Name: Specifies the password for the SNMP trap community.

SNMPv3: Enables or disables the SNMPv3 feature.

User Name: Specifies the username for SNMPv3.

Auth Protocol: Selects the authentication protocol type: MDS or SHA.

Auth Key: Specifies the authentication key.

Priv Protocol: Selects the privacy protocol type: DES.

Priv Key: Specifies the privacy key for privacy.

Engine ID: Specifies the engine ID for SNMPv3.

Apply Save: Click **Apply Save** to apply the changes.

CLI Settings

CLI: The Command Line Interface (CLI) allows you to type commands instead of choosing them from a menu or selecting an icon.

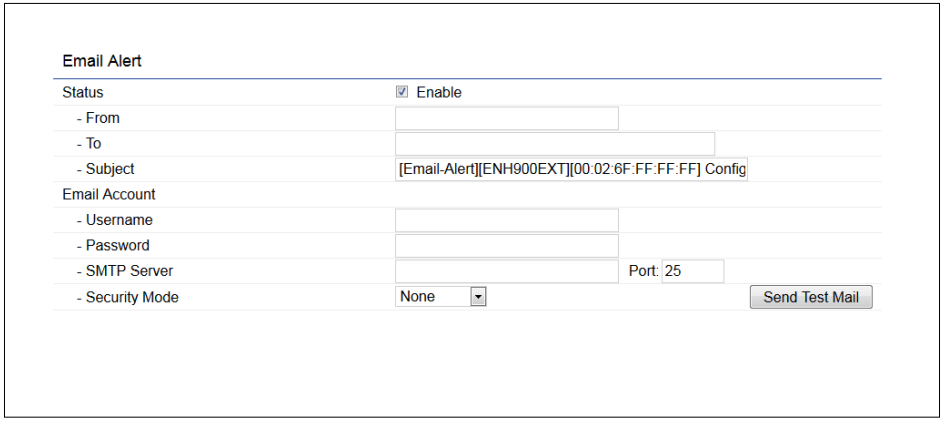
SSH: Enable Secure Shell (SSH) to make secure, encrypted connections in the network. Secure Shell is a network protocol that allows data to be exchanged using a secure channel between two network devices.

HTTPS: Enable HTTPS to transfer and display web content securely. The Hypertext Transfer Protocol over SSL (Secure Socket Layer) is a TCP/IP protocol used by web servers to transfer and display web content securely.

Email Alert

You can use the Email Alert feature to send messages to the configured email address when particular system events occur.

Note: Do **NOT** use your personal email address as it can unnecessarily expose your personal email login credentials. Use a separate email account made for this feature instead



From: Enter the email address to show the sender of the email.

To: Enter the address that you wish to send emails to.

Subject: Enter the text that you wish to appear in the email's subject line.

Username: Enter the username for the email account that will be used to send emails.

Password: Enter the password for the email account that will be used to send emails.

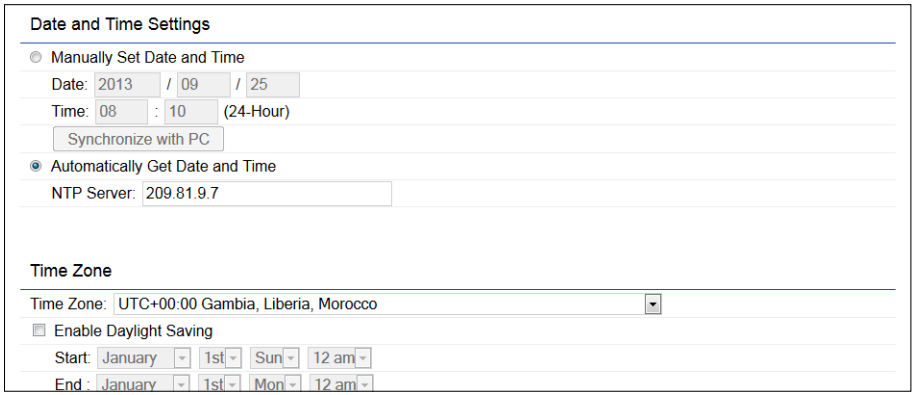
SMTP Server: Enter the IP address or hostname of the outgoing SMTP server.

Port: Enter the SMTP port number to use for outbound emails.

Time Zone

Time Setting

This page allows you to set the internal clock of the ENH220EXT.



Manually Set Date and Time: Manually specify the date and time.

Automatically Get Date and Time: Select and check whether you wish to enter the IP address of an NTP server or use the default NTP server to have the internal clock set automatically.

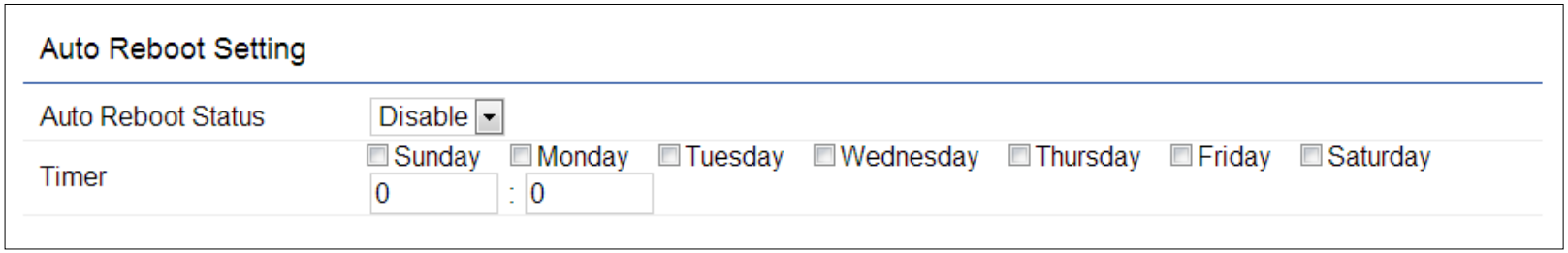
Enable Daylight Saving: Check whether daylight savings applies to your area.

Start: Select the day, month, and time when daylight savings time starts.

End: Select the day, month, and time when daylight savings times ends.

Auto Reboot Settings

You can specify how often you wish to reboot the ENH220EXT.



Auto Reboot Setting: Enables or disables the Auto Reboot function.

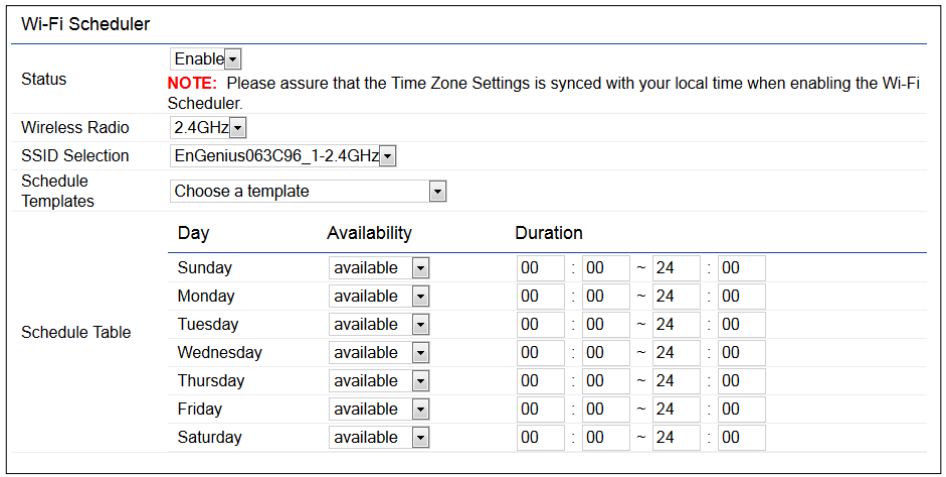
Frequency of Auto Reboot: Specifies how often you wish to reboot the ENH220EXT by Min, Hour, Day or Week.

Timer: Select the day and enter the time you would like to reboot automatically.

Save: Click **Save** to apply the changes.

Wi-Fi Scheduler

The Wi-Fi Scheduler can be created for use in enforcing rules. For example, if you wish to restrict web access to Mon-Fri from 3:00 pm to 8:00 pm, you could create a schedule selecting Mon, Tue, Wed, Thu and Fri while entering a Start time of 3:00 pm and End Time of 8:00 pm to limit access to these times.



Status: Enables or disables the Wi-Fi scheduler function.

SSID Selection: Select a SSID from the drop-down list.

Schedule Templates: Select a schedule template from the drop-down list.

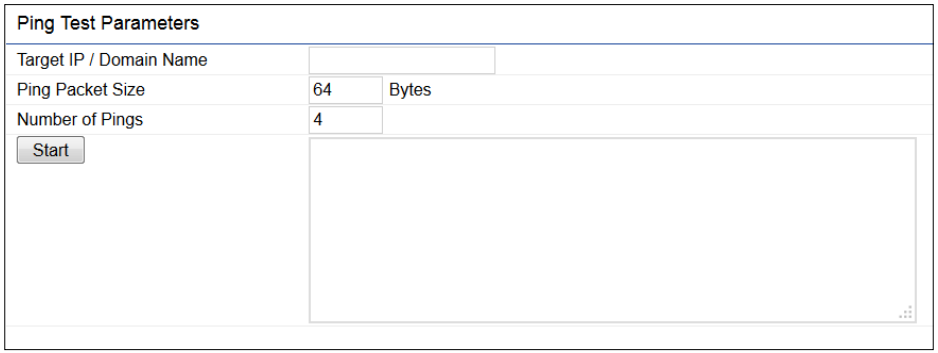
Day(s): Place a checkmark in the boxes for the desired days or select the **All Week** radio button to select all seven days of the week.

Duration: The Start Time is entered in two fields. The first box is for hours and the second box is for minutes. The End Time is entered in the same format as the Start time.

Tools

Ping Test Parameters

This page allows you to analyze the connection quality of the ENH220EXT and trace the routing table to a target in the network.



Target IP: Enter the IP address you would like to search.

Ping Packet Size: Enter the packet size of each ping.

Number of Pings: Enter the number of times you wish to ping.

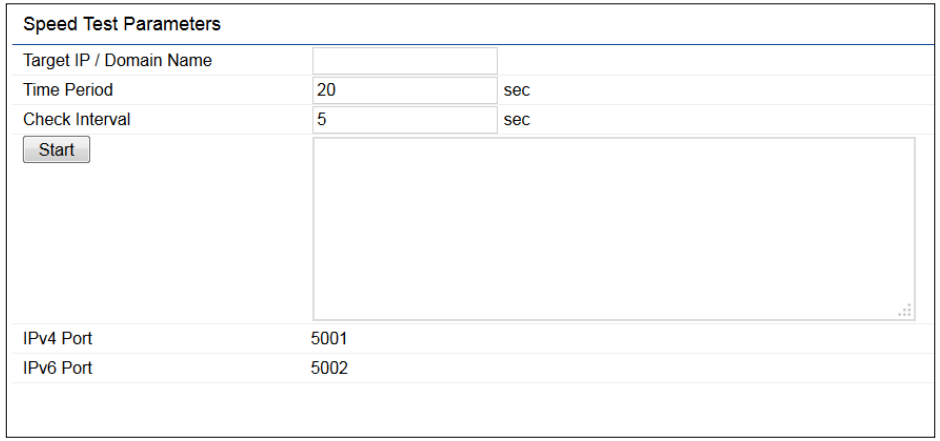
Start Ping: Click **Start Ping** to begin pinging the target device (via IP).

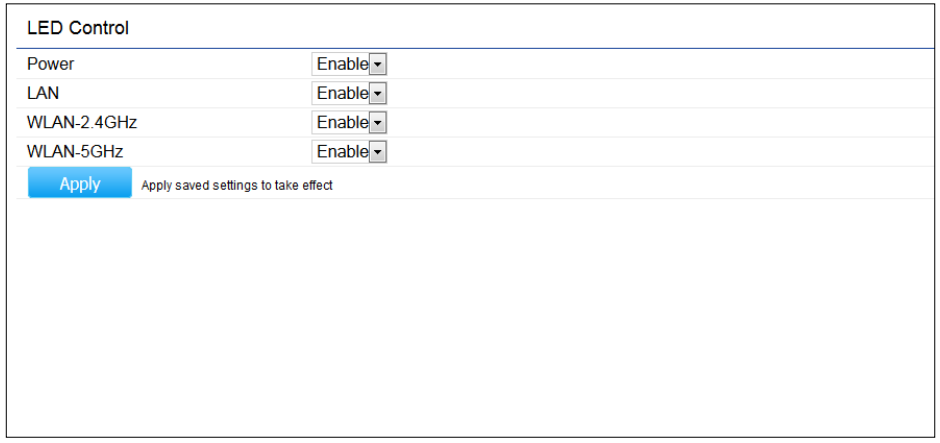
Traceroute Target: Enter the IP address or domain name you wish to trace.

Start Traceroute: Click **Start Traceroute** to begin the trace route operation.

Speed Test Parameters / LED Control

This page allows you to control LED on/off for Power, LAN interface, or 2.4 GHz WLAN interface.





LED Control

Power: Enables or disables the Power LED indicator.

LAN: Enables or disables the LAN LED indicator.

WLAN-2.4 GHz: Enables or disables the WLAN-2.4 GHz LED indicator.

Device Discovery

This page allows you to discover devices from network for Operation Mode, IP Address, System MAC Address and Firmware version.

Account

This page allows you to change the ENH220EXT username and password. By default, the username is: **admin** and the password is: **admin**. The password can contain from 0 to 12 alphanumeric characters and is case sensitive.

Account Settings

Administrator Username: Enter a new username for logging in to the New Name entry box.

Current Password: Enter the old password for logging in to the Old Password entry box.

New Password: Enter the new password for logging in to the New Password entry box.

Verify Password: Re-enter the new password in the Confirm Password entry box for confirmation.

Apply: Click **Apply** to apply the changes.

Firmware

Firmware Upgrade

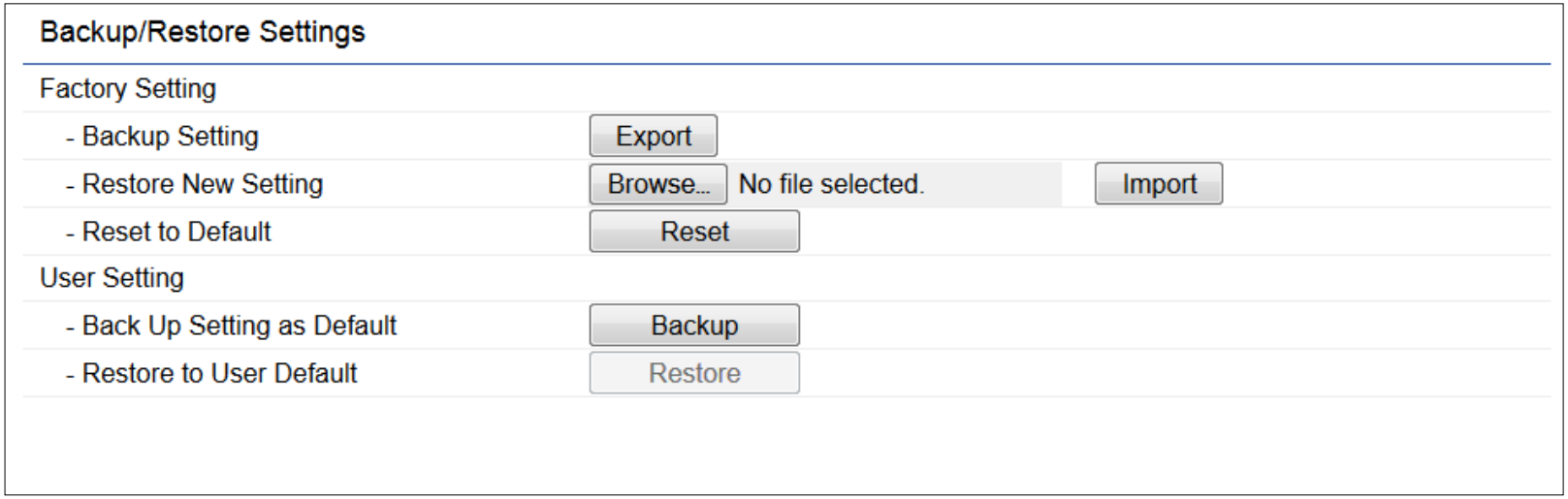
This page allows you to upgrade the firmware of the ENH220EXT.

To Perform the Firmware Upgrade:

1. Click the **Choose File** button and navigate the OS file system to the location of the upgrade file.
2. Select the upgrade file. The name of the file will appear in the Upgrade File field.
3. Click the **Upload** button to commence the firmware upgrade.

   Note: The device is unavailable during the Firmware upgrade process and must restart when the upgrade is completed. Any connections to or through the device will be lost.

Backup/Restore



Factory Setting

The function allows you to export the current device configurations. When you export your configurations, you also can reload the saved configurations into the device through the Restore Saved Settings from a file section. If extreme problems occur, or if you have set the ENH220EXT incorrectly, you can use the Reset button in the Revert to Factory Default Settings section to restore all the configurations of the ENH220EXT to the original default settings.

Backup Setting: Click **Export** to save the current configured settings.

Restore New Setting: To restore settings that have been previously backed up, click **Browse**, select the file, and click **Restore**.

Restore to Default: Click **Reset** button to restore the ENH220EXT to its factory default settings.

User Setting

The User Setting section allows you to backup the current device configurations into the ENH220EXT as the default value. If extreme problems occur, or if you have set the ENH220EXT incorrectly, you can push the Reset button to revert all the configurations of the ENH220EXT to the user default instead of the factory default.

Back Up Setting as Default: Click **Backup** to backup the user settings you would like to the device's memory for the default settings.

Restore to User Default: Click **Restore** to restore the user setting to factory default settings.

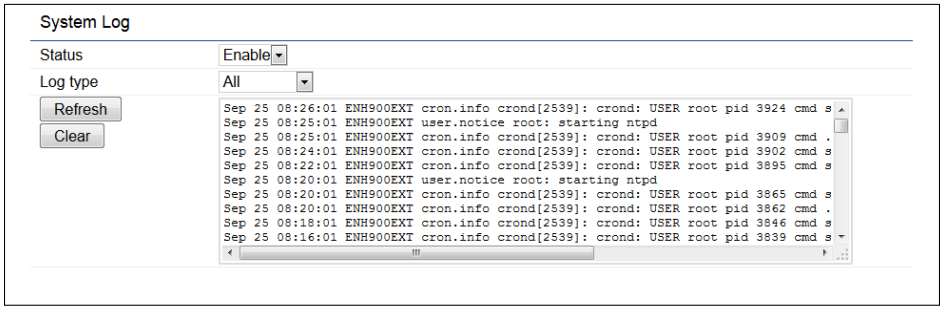
Note1: After configuring the current settings as default, you should click the **Restore to Default** on the web interface for reverting the settings into the factory default instead of pushing the reset button.

Note2: Please **write down** your account and password before saving. The user settings will now become the new default settings at the next successful login.

Log

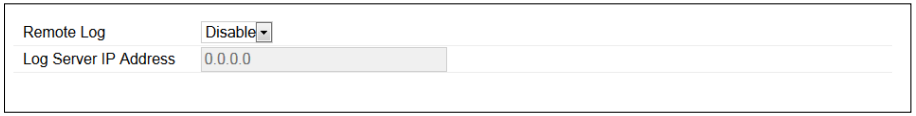
System Log

The ENH220EXT automatically logs (records) events of possible interest in its internal memory. To view the logged information, click the **Log** link under the **System Manager** menu. If there is not enough internal memory to log all events, older events are deleted from the log via the recycle method.When powered down or rebooted, the log will be cleared.



Remote Log

This page allows you to setup the Remote Log functions for the ENH220EXT.



Syslog: Enables or disables the syslog function.

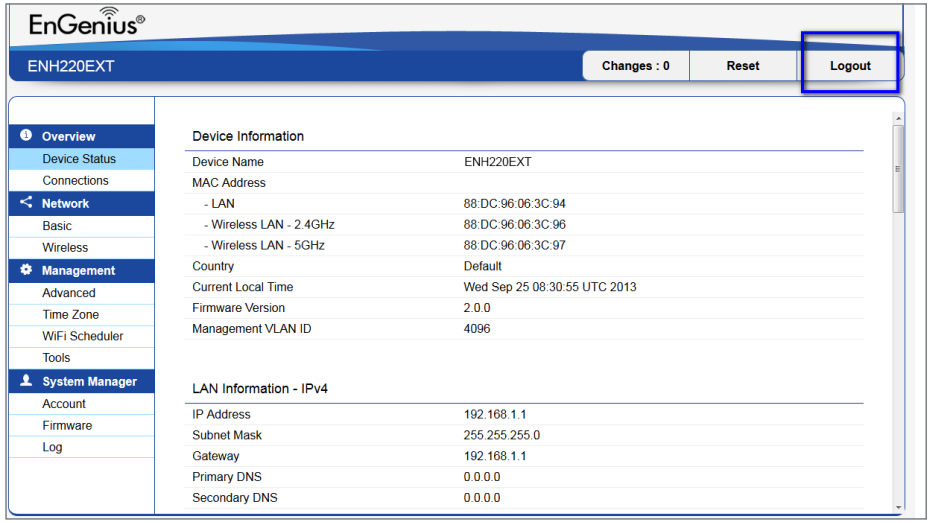
Log Server IP Address: Enter the IP address of the log server.

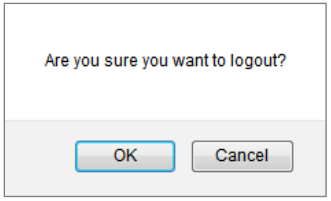
Remote Log: Enable or disable the remote log service.

Apply: Click **Apply** to apply the changes.

Logout

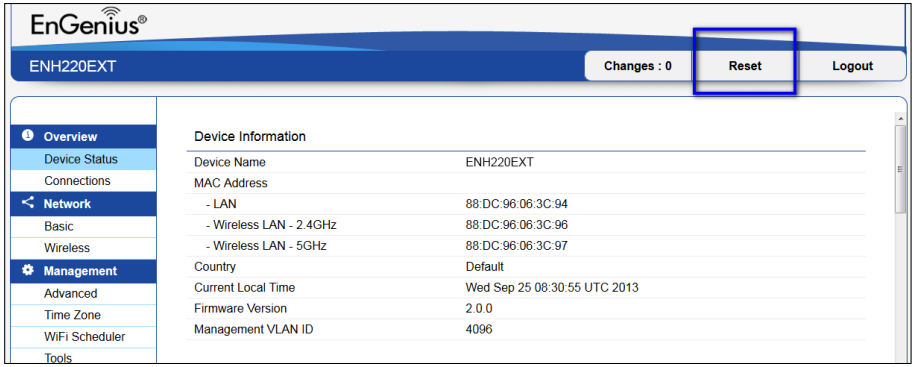
Click **Logout** in Management menu to logout.

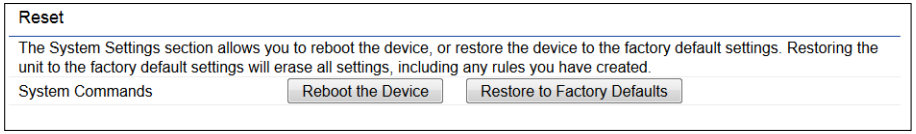




Reset

In some circumstances, it may be required to force the device to reboot. Click on **Reset** to reboot the ENH220EXT.





Appendix

Appendix A

Federal Communication Commission Interference Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- IIncrease the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

IMPORTANT NOTE:
Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 23cm between the radiator & your body.

Appendix B - CE Interference Statement

Europe – EU Declaration of Conformity

This device complies with the essential requirements of the R&TTE Directive 1999/5/EC. The following test methods have been applied in order to prove presumption of conformity with the essential requirements of the R&TTE Directive 1999/5/EC:

- **EN60950-1**
  Safety of Information Technology Equipment
- **EN50385**
  Generic standard to demonstrate the compliance of electronic and electrical apparatus with the basic restrictions related to human exposure to electromagnetic fields (0 Hz - 300 GHz)
- **EN 300 328**
  Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband Transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques; Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive
- **EN 301 489-1**
  Electromagnetic compatibility and Radio Spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements
- **EN 301 489-17**
  Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for 2,4 GHz wideband transmission systems and 5 GHz high performance RLAN equipment

CE 0560 ⓘ

Česky [Czech]	[Jméno výrobce] tímto prohlašuje, že tento [typ zařízení] je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
Dansk [Danish]	Undertegnede [fabrikantens navn] erklærer herved, at følgende udstyr [udstyrets typebetegnelse] overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
Deutsch [German]	Hiermit erklärt [Name des Herstellers], dass sich das Gerät [Gerätetyp] in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
Eesti [Estonian]	Käesolevaga kinnitab [tootja nimi = name of manufacturer] seadme [seadme tüüp = type of equipment] vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
English	Hereby, [name of manufacturer], declares that this [type of equipment] is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Español [Spanish]	Por medio de la presente [nombre del fabricante] declara que el [clase de equipo] cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ [name of manufacturer] ΔΗΛΩΝΕΙ ΟΤΙ [type of equipment] ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.

Français [French]	Par la présente [nom du fabricant] déclare que l'appareil [type d'appareil] est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
Italiano [Italian]	Con la presente [nome del costruttore] dichiara che questo [tipo di apparecchio] è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Ar šo [name of manufacturer / izgatavotāja nosaukums] deklarē, ka [type of equipment / iekārtas tips] atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lietuvių [Lithuanian]	Šiuo [manufacturer name] deklaruoja, kad šis [equipment type] atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
Nederlands [Dutch]	Hierbij verklaart [naam van de fabrikant] dat het toestel [type van toestel] in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
Malti [Maltese]	Hawnhekk, [isem tal-manifattur], jiddikjara li dan [il-mudel tal-prodott] jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
Magyar [Hungarian]	Alulírott, [gyártó neve] nyilatkozom, hogy a [... típus] megfelel a vonatkozó alapvetõ követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak.
Polski [Polish]	Niniejszym [nazwa producenta] oświadcza, że [nazwa wyrobu] jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
Português [Portuguese]	[Nome do fabricante] declara que este [tipo de equipamento] está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
Slovensko [Slovenian]	[Ime proizvajalca] izjavlja, da je ta [tip opreme] v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
Slovensky [Slovak]	[Meno výrobcu] týmto vyhlasuje, že [typ zariadenia] spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
Suomi [Finnish]	[Valmistaja = manufacturer] vakuuttaa täten että [type of equipment = laitteen tyyppimerkintä] tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Svenska [Swedish]	Härmed intygar [företag] att denna [utrustningstyp] står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

Appendix C - Professional Installation Instruction

Installation Personal

This product is designed for specific application and needs to be installed by a qualified personal who has RF and related rule knowledge. The general user shall not attempt to install or change the setting.

Installation Location

The product shall be installed at a location where the radiating antenna can be kept 23cm from nearby person in normal operation condition to meet regulatory RF exposure requirement.

External Antenna

Use only the antennas which have been approved by the applicant. The non-approved antenna(s) may produce unwanted spurious or excessive RF transmitting power which may lead to the violation of FCC limit and is prohibited.

Installation Procedure

Please refer to user's manual for the detail.

Warning:

Please carefully select the installation position and make sure that the final output power does not exceed the limit set force in relevant rules. The violation of the rule could lead to serious federal penalty.